RECORD OF COMMUNICATION

☐ OTHER (SPECIFY)

159949

TO:

FROM:

(Record of item checked above)

DATE 8/31/88

TIME 9:45 pm

SUBJECT

MEETING - AMP + EPA

SUMMARY OF COMMUNICATION

Members

Thomas J. Buntin - E.P.A. hydrogeologist
Gordon A. West - Roy F. Weston
Ben Klingler - AMP INC.
Paul Kautz - AMP Inc.
Amy DeLong - EPA - PACRES
Lisa Mutch - EPA - CARES, Project Officer
Joe Kotzinski - EPA - Section Chief - CARES
Paul Miller - R.E. Wright

10:00 am.

7B

8/31/88

Paul R. Miller
Project Manager

r.e. wright associates, inc.
earth resources consultants

3240 schoolhouse road
middletown, pa 17057-3595

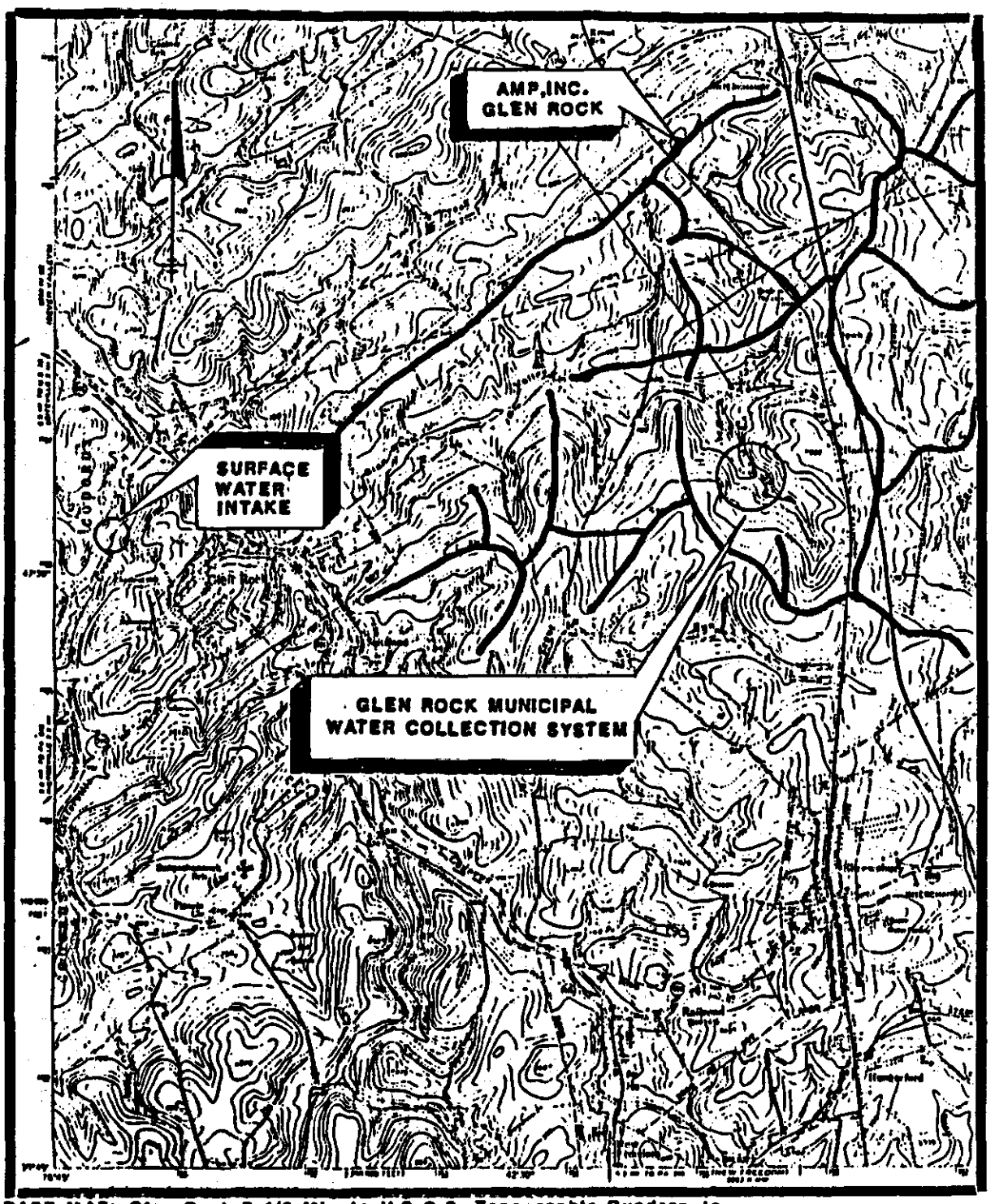
717-944-5501

INFORMATION COPIES
TO:

AMP INCORPORATED
GLEN ROCK FACILITY

SUMMARY DATA PACKAGE

Submitted to EPA, Philadelphia
By R. E. Wright Associates, Inc.
August 31, 1988



BASE MAP: Glen Rock 7 1/2 Minute U.S.G.S. Topographic Quadrangle

7 mi. south of York, PA
7 mi. N of PA-MD border

AMP - total contaminated plume is contained w/in Seaks Run drainage basin

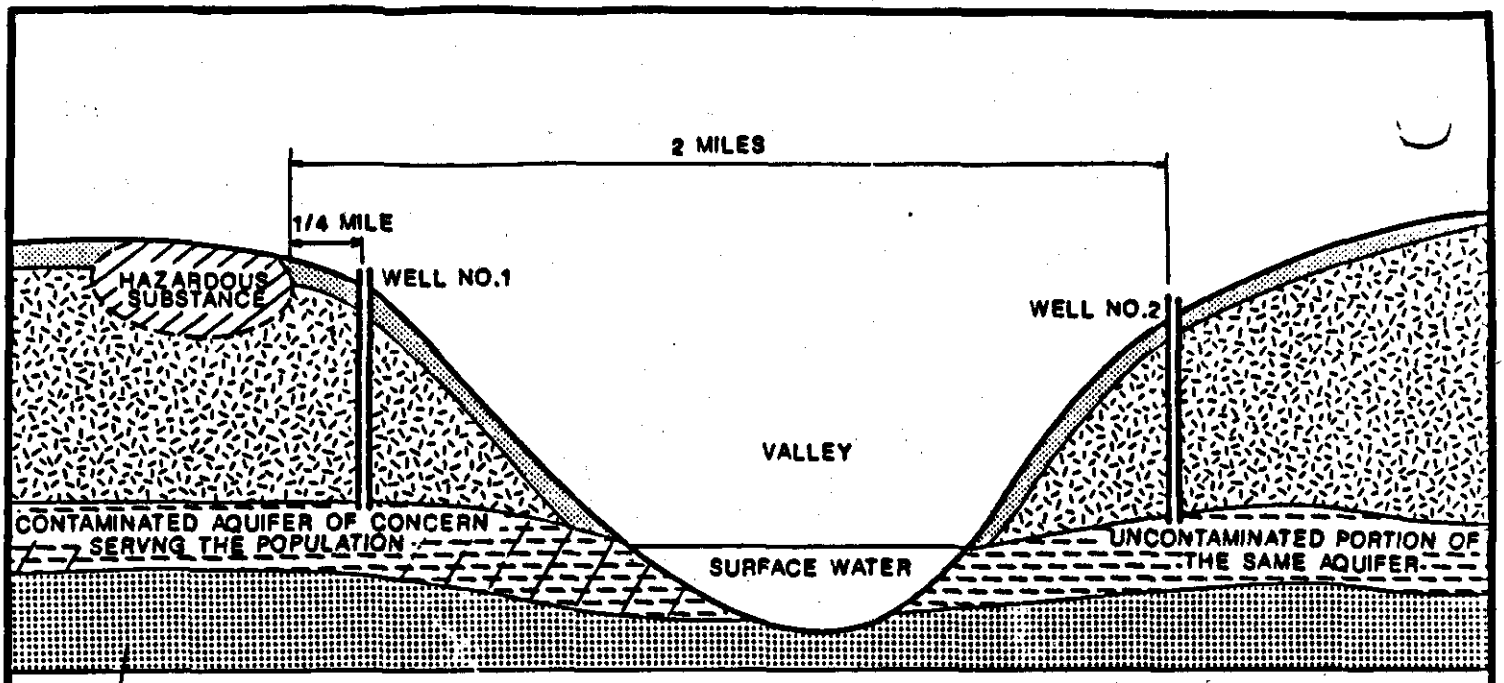
LOCATION OF GLEN ROCK MUNICIPAL WATER COLLECTION SYSTEM

0 2000'
SCALE

r.e. wright associates, inc.

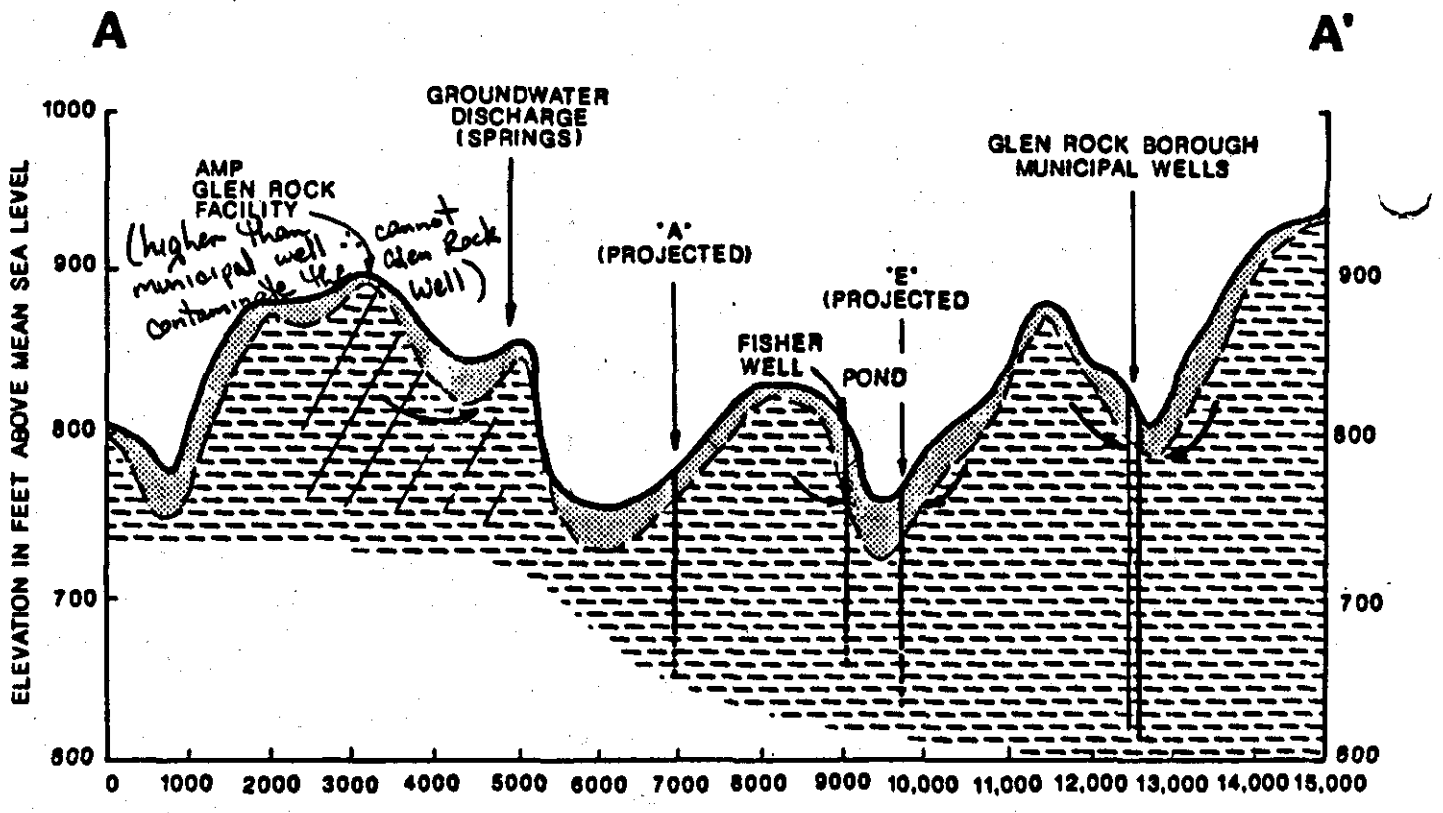
TCE

AR000403



FROM U.S. EPA, UNCONTROLLED HAZARDOUS WASTE SITE RANKING SYSTEM: A USER'S MANUAL

1500 (high transmissivity)



VERTICAL EXAGGERATION = 20 TO 1

LEGEND

- CONTAMINATED PORTION OF THE FORMATION
- UNCONTAMINATED PORTION OF THE FORMATION
- GROUNDWATER FLOW DIRECTION (BASED ON OCCURRENCE OF SPRINGS OR FLOWING WELLS)
- SAPROLITE
- LOCATION AND VERTICAL EXTENT OF WELLS SAMPLED BY PA DER 1987-1988, DASHED WHERE DEPTH INFERRED

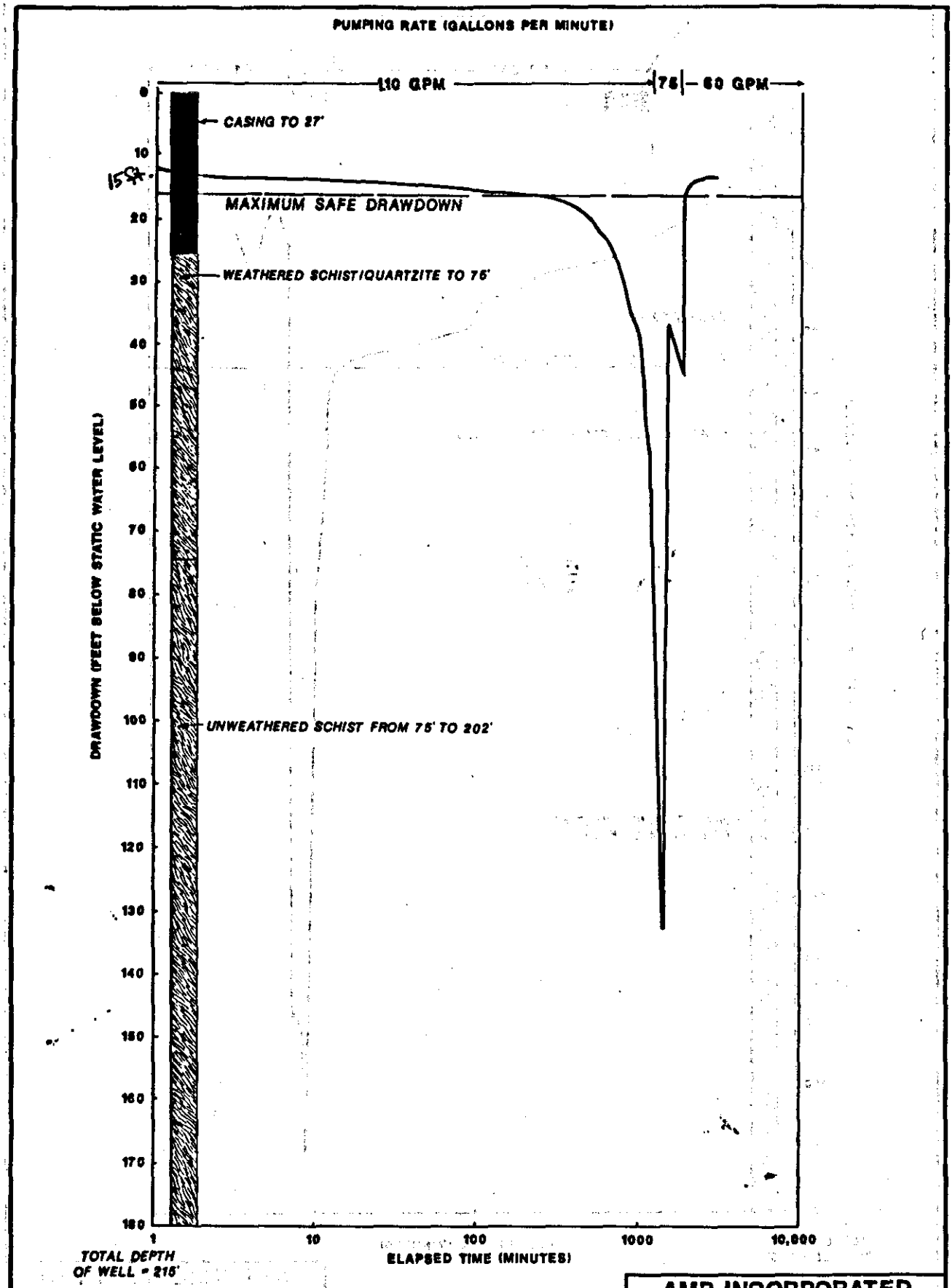
AMP INCORPORATED

GLEN ROCK PLANT

COMPARISON OF CONCEPTUAL AND ACTUAL AQUIFER DISCONTINUITIES

drawn CCS	approved HRM	drawing no. 86018-057-AA
checked HRM	date 8-15-88	

r. e. wright associates, inc.
earth resources consultants
middletown, pa. westminster, md



H_2O level is shallow (15 ft.)

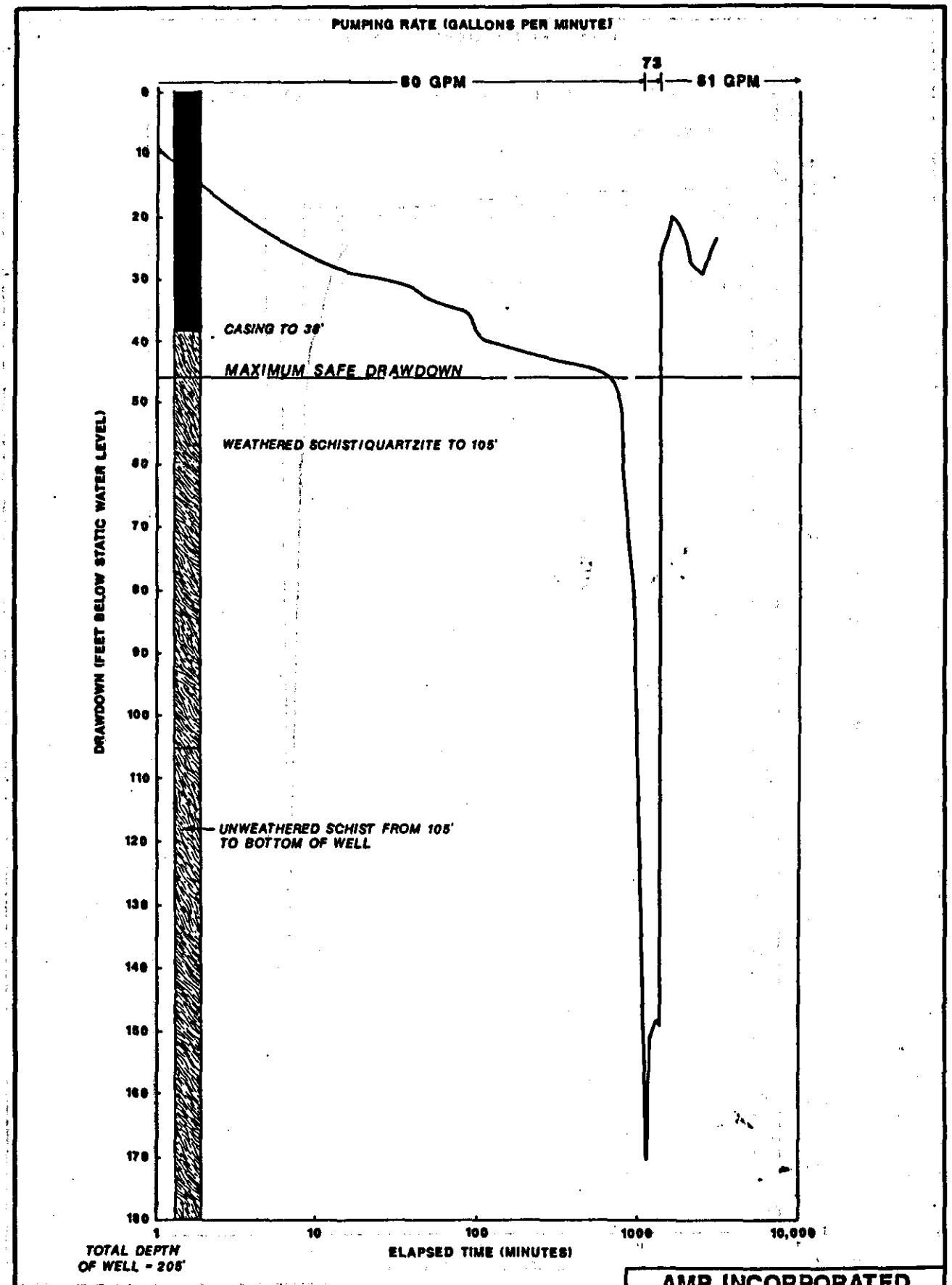
Water Supply well

AMP INCORPORATED
GLEN ROCK FACILITY

GLEN ROCK MUNICIPAL WELL FIELD
WELL NO. 2 48 HOUR PUMPING TEST

drawn CCS	approved	drawing no.
checked	date 8 26 88	88016-058-A

F. C. wright associates, inc.
earth resources consultants
pennsylvania



H_2O level is shallow (45 ft.)

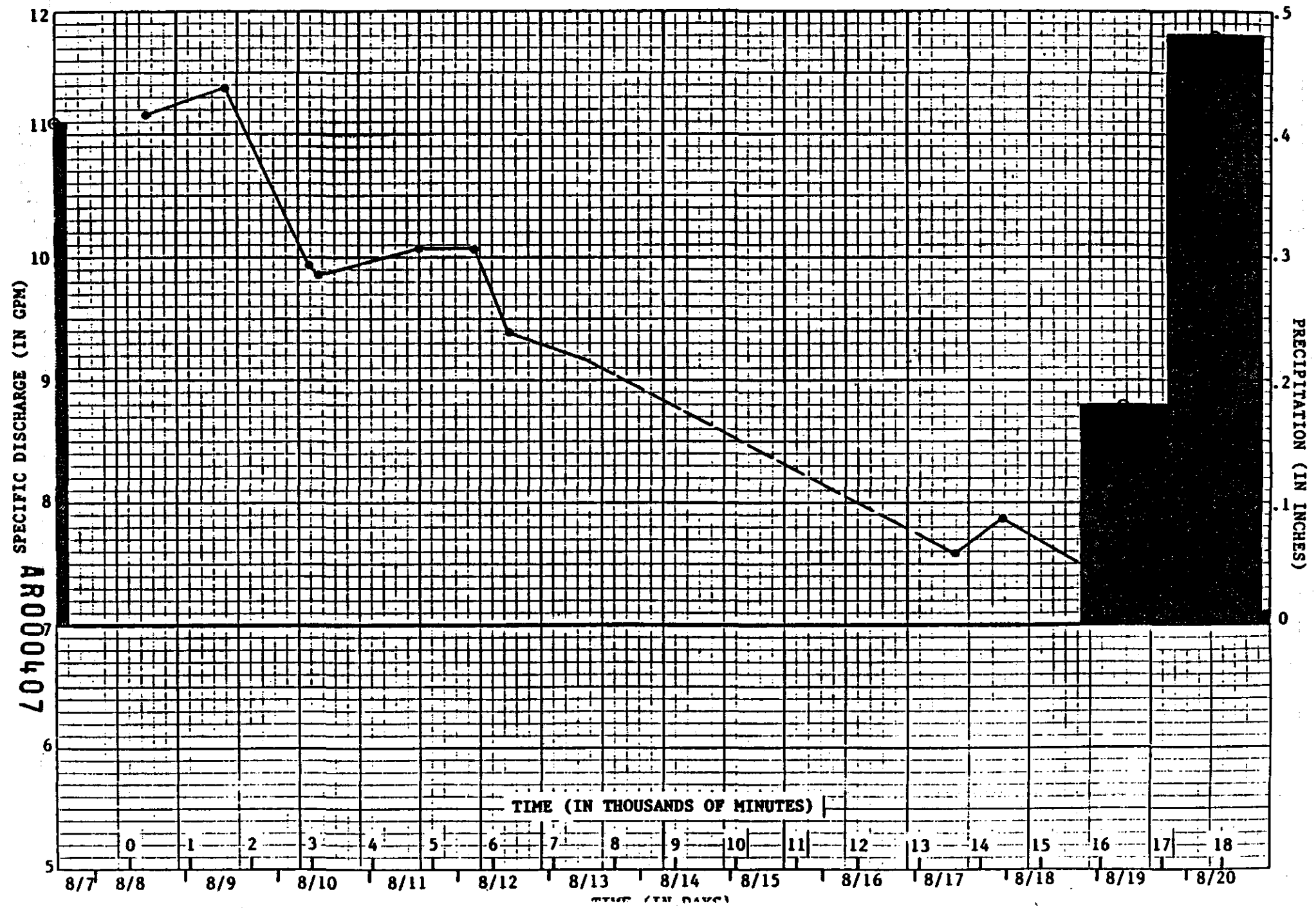
AMP INCORPORATED
GLEN ROCK FACILITY

GLEN ROCK MUNICIPAL WELL FIELD
WELL NO. 1 48 HOUR PUMPING TEST

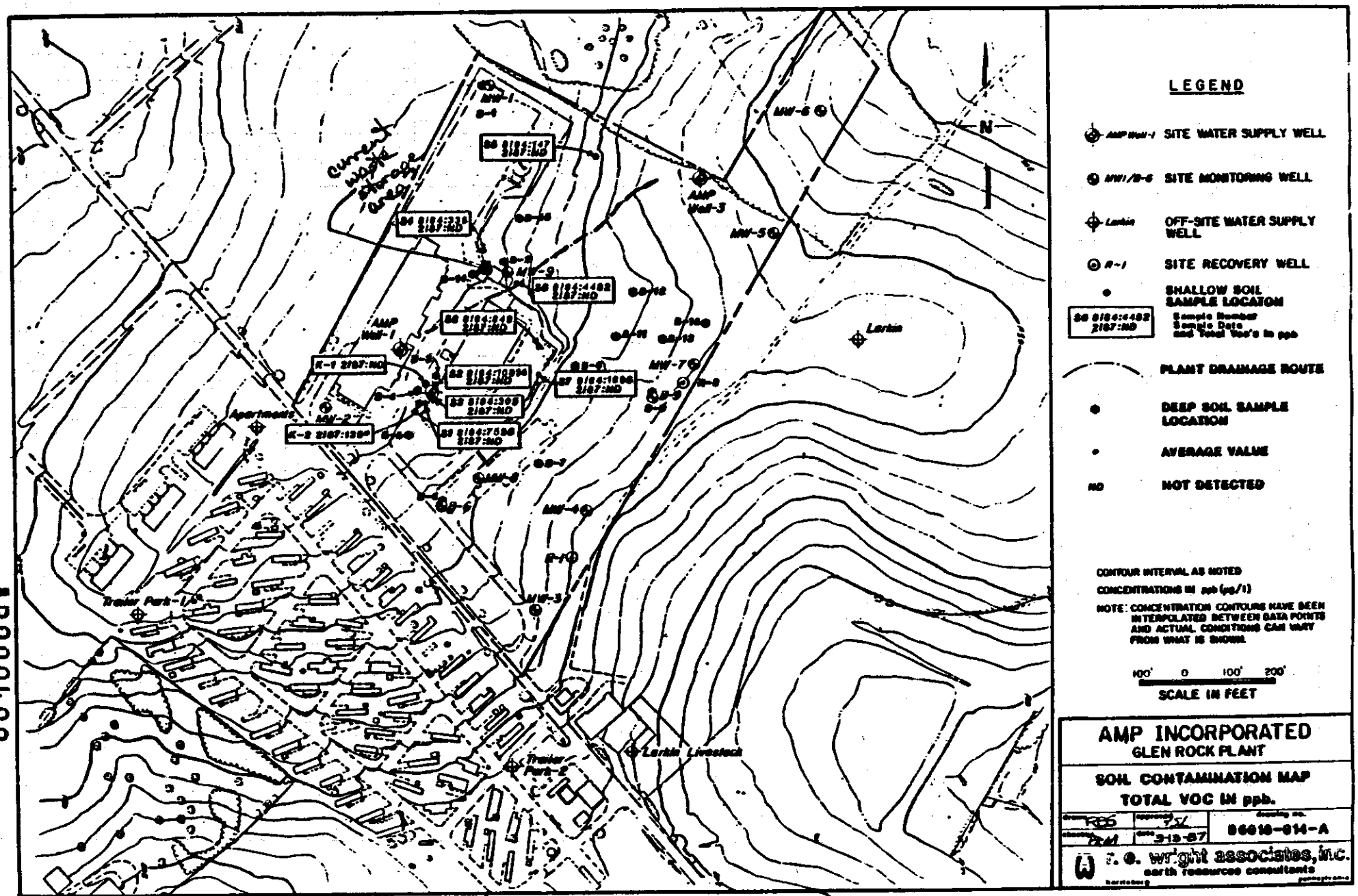
drawn CCS | approved | drawing no. 88018-057-A
checked | date 8 26 88

r. g. wright associates, inc.
earth resources consultants

↑ precip. → ↑ discharge

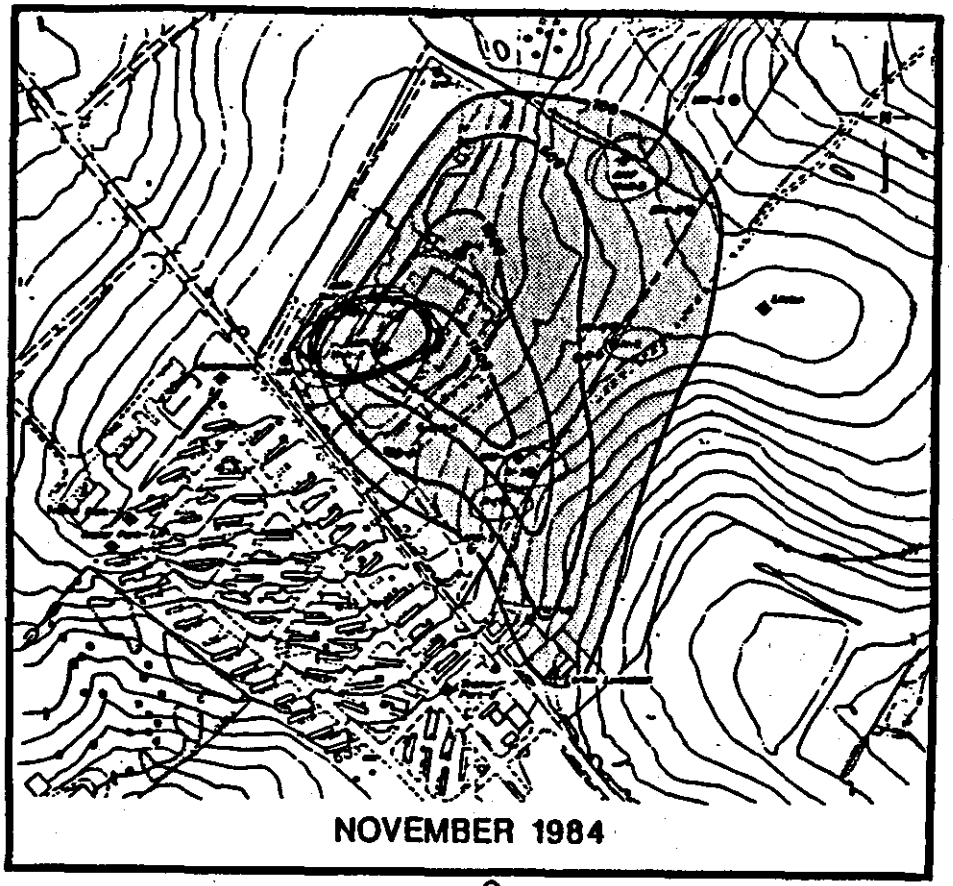


AR000407

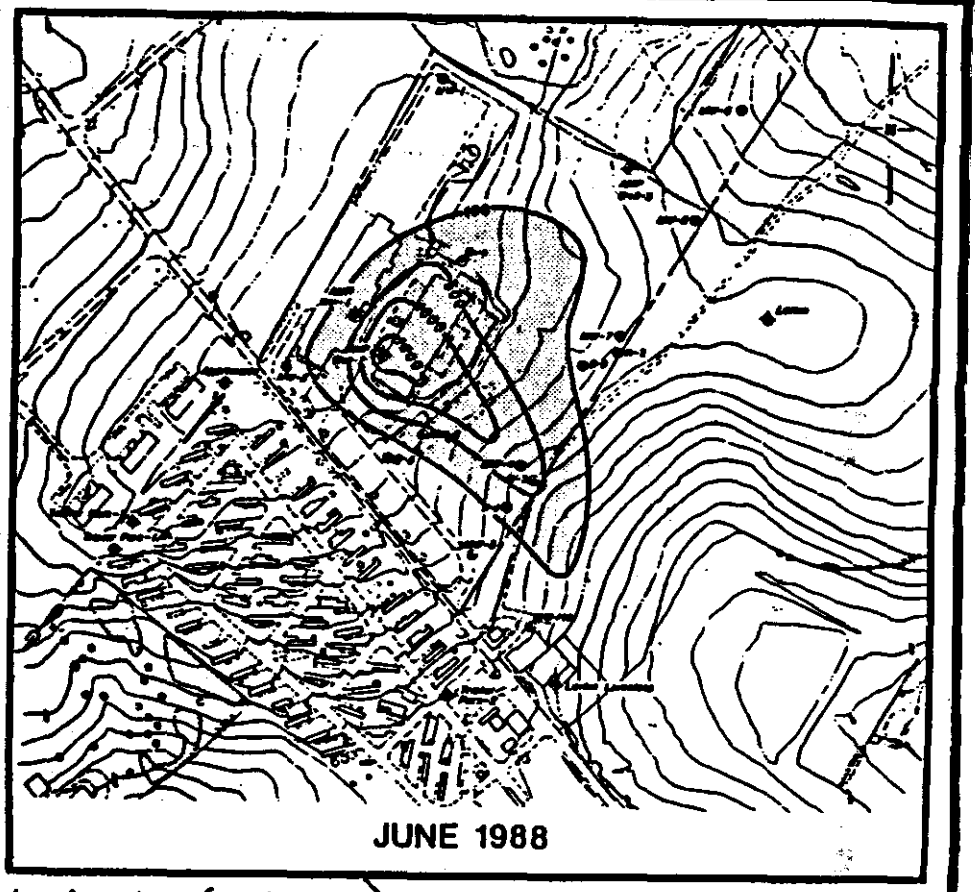


ARO00408

Shallow Soil samples taken in 1984 (detected up to 15 ppm TVOC)
Revisited 1987 – below detection limits everywhere
No deep soils contamination over 5 ft



NOVEMBER 1984



JUNE 1988

Initial source of contamination – well pit behind lab (wash area) (Amp 2)

Amp 2
Amp 3
R1, 2, 3, 4
} Recovery Wells

Now used as a removal well (air stripper)

LEGEND

- SITE WATER SUPPLY WELL — AMP WELL-1 (ND or 11,2TCA ppb)
- OFF-SITE WATER SUPPLY WELL — Larkin
- SITE MONITORING WELL — MW11B-6
- —100— TOTAL VOLATILE ORGANIC COMPOUND CONCENTRATION ISOPLETH
- SITE RECOVERY WELL — R-1

stripping towers

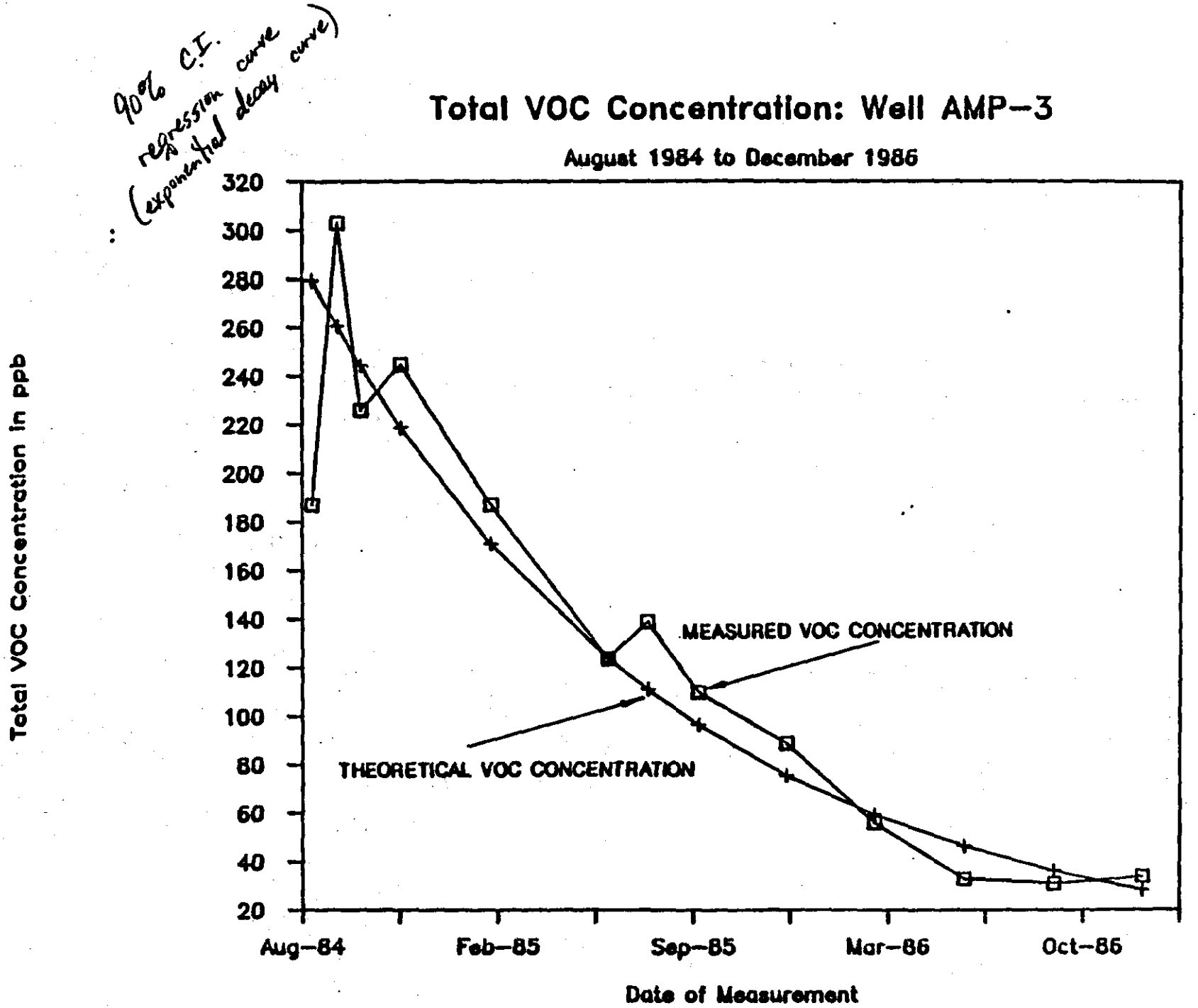
500' 0 500'
SCALE IN FEET (APPROXIMATE)

AMP INCORPORATED		
GLEN ROCK PLANT		
MAXIMUM AND CURRENT EXTENT OF TVOC PLUME		
drawn CCS	designed PRM	drawing no. 86018-056-AA
checked PRM	date 8-12-88	
r. e. wright associates, inc. earth resources consultants		

NOTE: Maps from REWAI November 1984 and June 1988 Studies

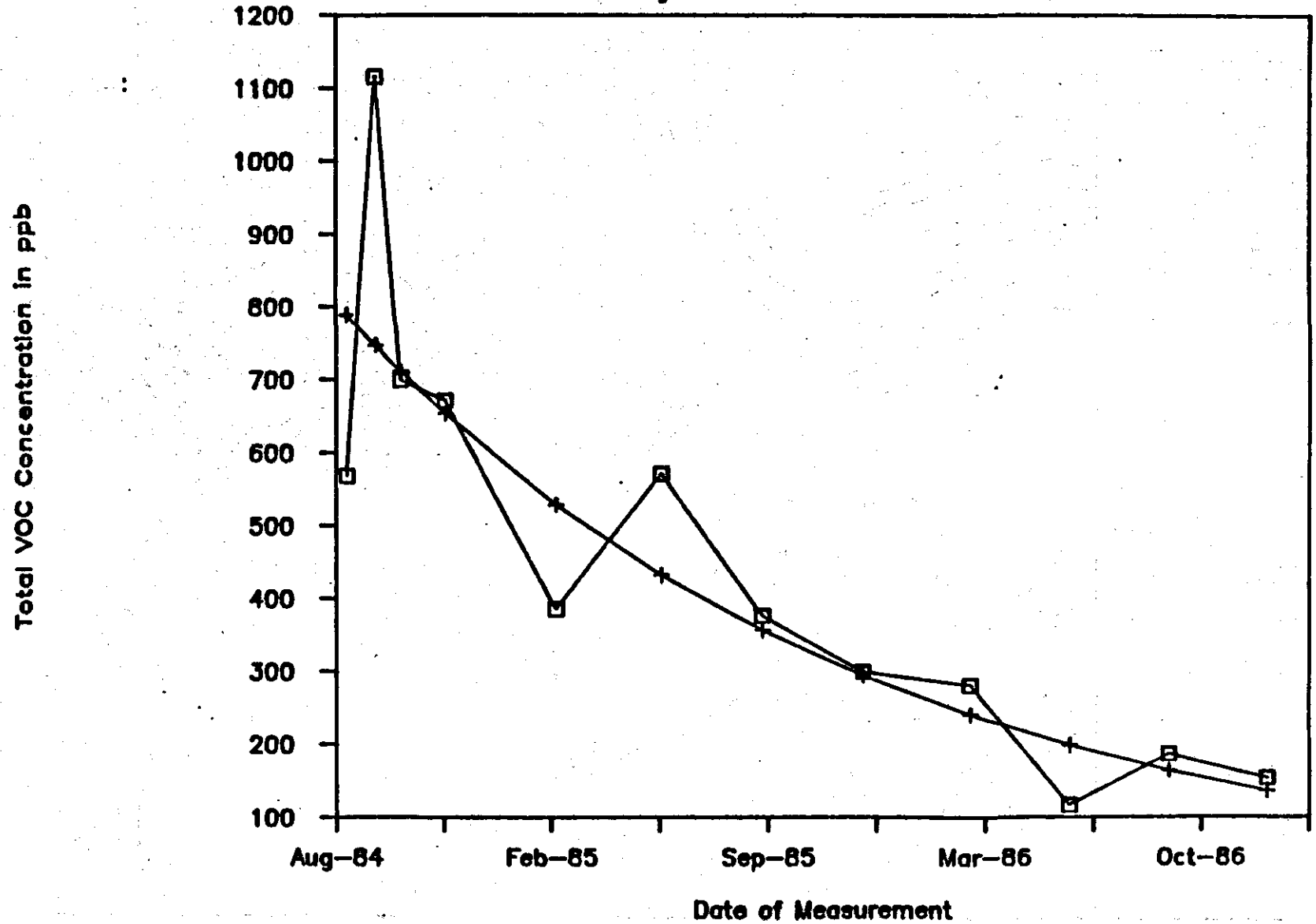
ARGUMENTS

90% C.I. regression curve (exponential decay curve)

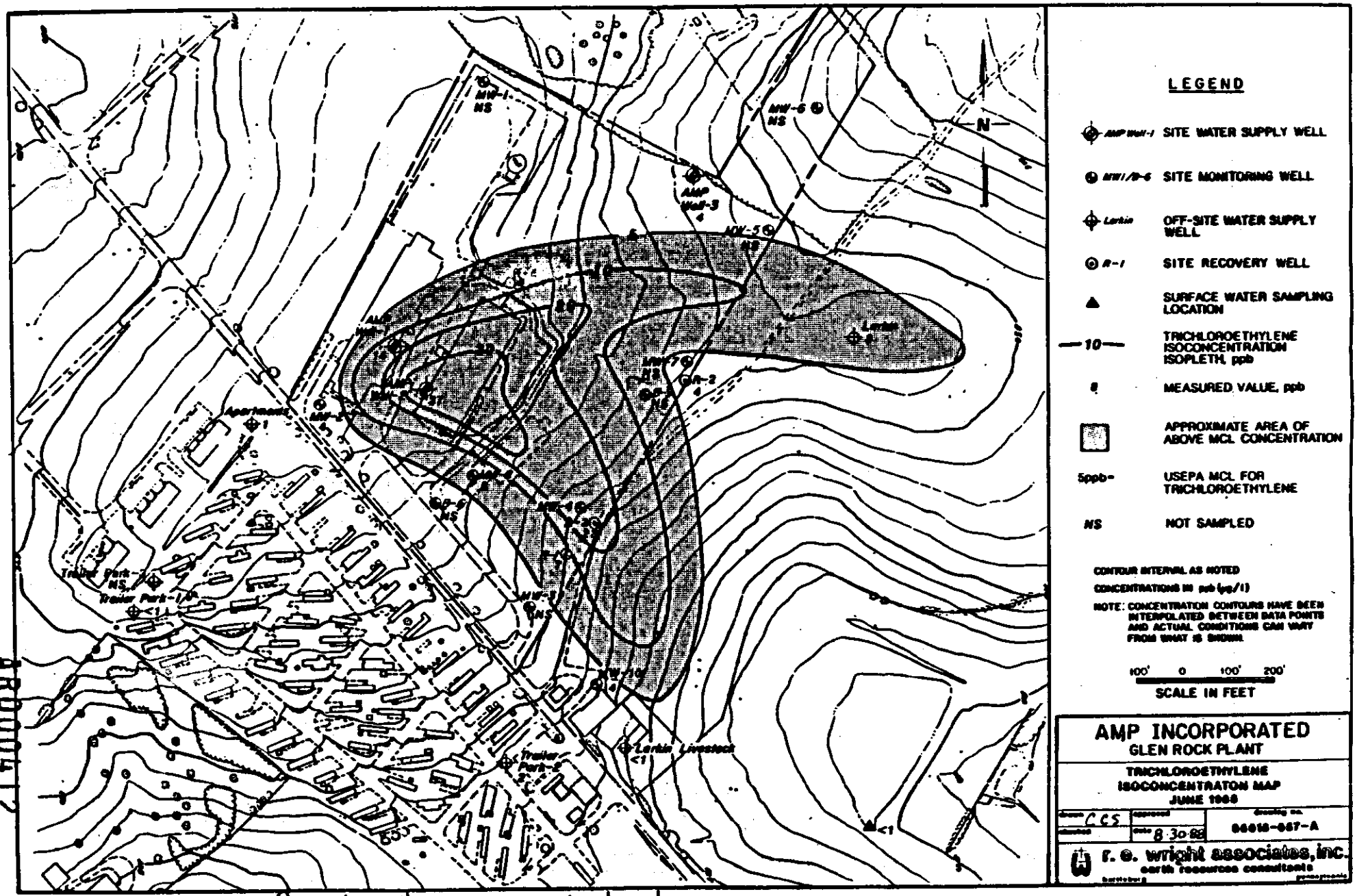


Total VOC Concentration: Well AMP-1

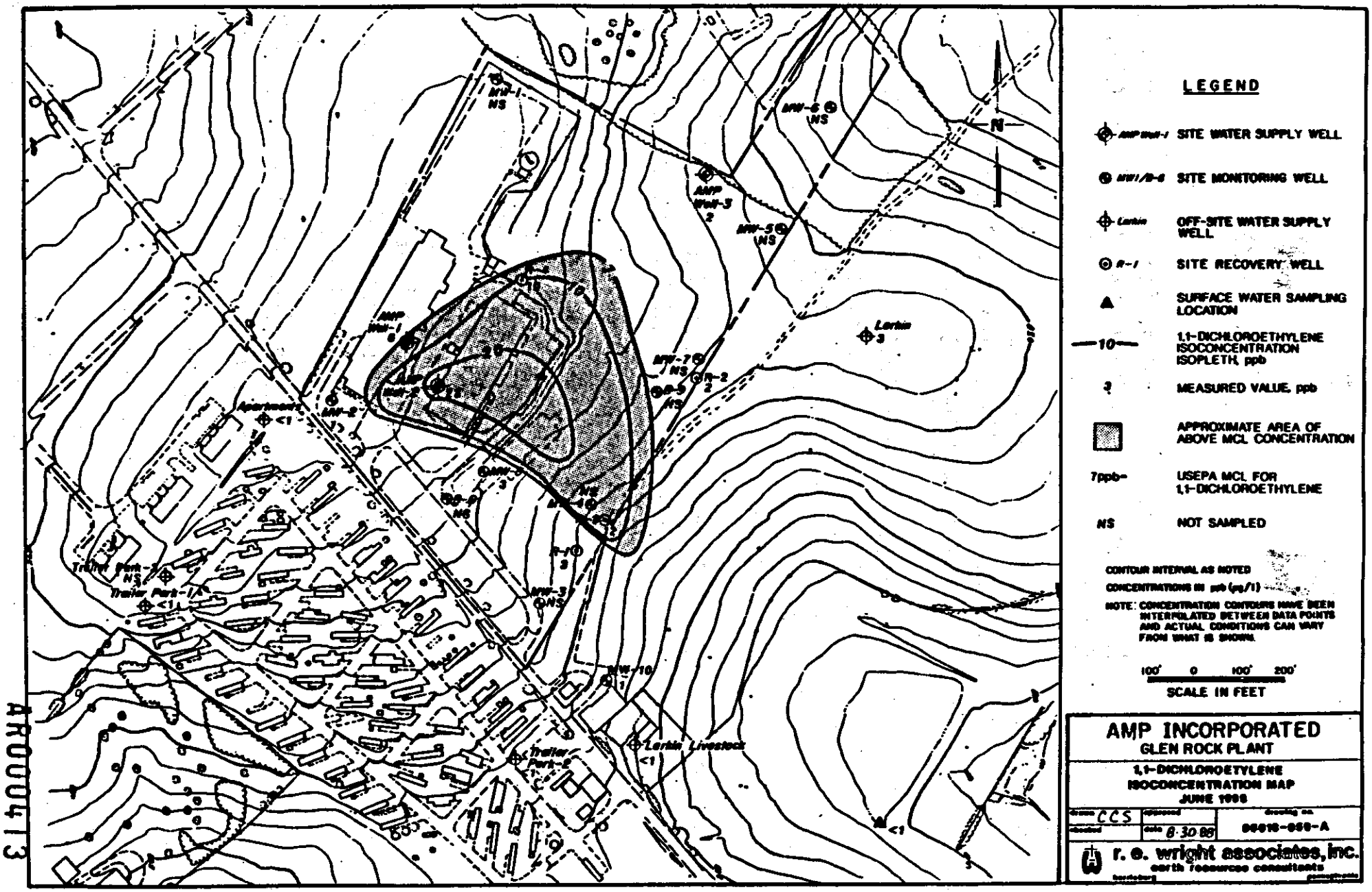
August 1984 to December 1986



TCE



-3-D picture of contamination -vertical contam.
-ft rates
- removal rates


MW-1 NS
MW-6 NS
AMP Well-3 2
MW-5 NS
AMP Well-1 6
AMP Well-2 11
Larkin 3
MW-7 NS
R-2 2
SG-5 NS
Apartment <1
MW-2
MW-4 NS
SG-6 NS
R-1 2
MW-3 NS
Trailer Park-3 NS
Trailer Park-1 <1
MW-10 1
Trailer Park-2 <1
Larkin Livestock <1
<1
N
LEGEND
SITE WATER SUPPLY WELL
SITE MONITORING WELL
OFF-SITE WATER SUPPLY WELL
SITE RECOVERY WELL
SURFACE WATER SAMPLING LOCATION
10
1,1-DICHLOROETHYLENE ISOCONCENTRATION ISOPLETH, ppb
3
MEASURED VALUE, ppb
APPROXIMATE AREA OF ABOVE MCL CONCENTRATION
7ppb
USEPA MCL FOR 1,1-DICHLOROETHYLENE
NS
NOT SAMPLED
CONTOUR INTERVAL AS NOTED
CONCENTRATIONS IN ppb (µg/l)
NOTE: CONCENTRATION CONTOURS HAVE BEEN INTERPOLATED BETWEEN DATA POINTS AND ACTUAL CONDITIONS CAN VARY FROM WHAT IS SHOWN.
100' 0 100' 200'
SCALE IN FEET
AMP INCORPORATED
GLEN ROCK PLANT
1,1-DICHLOROETYLENE
ISOCONCENTRATION MAP
JUNE 1988
drawn CCS
checked
date 8.30.88
drawing no. 88618-888-A
r. e. wright associates, inc.
earth resource consultants

AMP GLEN ROCK SITE CHRONOLOGY

8/14/84	R. E. Wright Associates, Inc. (REWAI) retained as hydrogeologic consultant by AMP for Glen Rock facility.
8/16-18/84	REWAI sampled groundwater in plant wells AMP-1, AMP-2, and AMP-3, also the distribution box and on-site sewage disposal system.
9/10/84	DER meeting with AMP, Baker/TSA, REWAI. DER approved work schedule and work scope. Mr. Jeff Molnar of Bureau of Water Quality Management assigned as official DER liaison party to review project.
9/11/84	REWAI instructed to continue coordination of all work with DER. Mr. Niel Swanson of U. S. EPA notified of incident.
9/11-13/84	REWAI performs additional on-site soils and groundwater analysis. Installation of portable stripping tower - AMP-2 converted to groundwater recovery well.
9/17/84	Fifteen test borings completed with OVA analysis using FID at boring collars, collection and analysis of soils for VOC concentrations.
10/12/84	DER meeting with AMP, Baker/TSA, REWAI to discuss results of soil and groundwater analyses.

11/20/84	Cooperative off-site sampling between DER Bureau of Community Environmental Control and AMP (REWAI).
11/84	Six monitoring wells emplaced.
11 & 12/84	Pumping tests of monitoring well MW-8, plant wells AMP-1 and AMP-2.
1/24/85	DER meeting with AMP and REWAI regarding AMP Glen Rock site joint sampling of 9/84 and to address concerns between differences in analyses and new water supply law.
3/13/85	DER meeting with Lori Davis of DER, AMP, and REWAI representatives. Purpose was to obtain clarification on early soil analyses. DER given full project summary and new soils data explanation.
3/85	Pumping test on monitoring well MW-2.
4/85	Remedial Investigation/Feasibility Study report issued by REWAI.
7/85	Seismic refraction survey.
9/85	Groundwater sampling (quarterly).
10/85	Floor drain study at plastics building.
10/15/85	DER meeting with AMP, REWAI. DER requests submission of written proposal and interim remedial system design package for approval.
11/85	Interim remedial system installed, R-1 installed, removal of oil contaminated soils from storm sewer outlet. DER permit application for the full remedial system program submitted.

12/85	Quarterly sampling, installation of remedial system air-stripping towers.
1/86	Plant remedial system towers replace the portable tower, R-1 brought on-line with recovery system; submittal of computer files of chemical analysis to DER for review.
3/86	Quarterly sampling.
6/86	Quarterly sampling.
9/86	Quarterly sampling; R-2 installed.
10/86	Summary report, Remedial Investigation study.
12/86	Quarterly sampling; R-2 on-line, R-1 and R-2 pumping tests.
2/87	1984 shallow soil sample locations retested and analyzed; air-stripping tower for Albright's Trailer Park completed; NPDES permit approved.
3/87	Quarterly sampling.
4/87	Remedial Investigation, Remedial Actions and HRS Ranking Report.
6/87	Quarterly sampling.
9/87	Quarterly sampling, R-3 and R-4 recovery wells brought on-line.
12/87	Quarterly sampling.
3/88	Quarterly sampling.
6/88	Quarterly sampling.

REWAI BIBLIOGRAPHY - AMP GLEN ROCK FACILITY

Remedial Investigation/Feasibility Study of Volatiles Organic Compounds at the Material Development Laboratory, AMP, Incorporated, Glen Rock, Pennsylvania, May 1985.

Summary Report. Remedial Investigation Study of Volatile Organic Compound Contamination of Site Groundwater at the Material Development Laboratory, October 1986.

Remedial Investigation, Remedial Actions, and Assessment of Site Hazard Ranking System Score, April 1987.

December 1986 - Glen Rock Quarterly Sampling Report
March 1987 - Glen Rock Quarterly Sampling Report
June 1987 - Glen Rock Quarterly Sampling Report
September 1987- Glen Rock Quarterly Sampling Report
December 1987 - Glen Rock Quarterly Sampling Report
March 1988 - Glen Rock Quarterly Sampling Report
June 1988 - Glen Rock Quarterly Sampling Report

r.e. wright associates, inc.
earth resources consultants

August 18, 1988

Mr. Dale Kortze, M/S 81-01
AMP Incorporated
Environmental Programs Department
P. O. Box 3608
Harrisburg, PA 17105-3608

Re: AMP Incorporated
Glen Rock Facility
REWAI Project 86018

Dear Mr. Kortze:

At your request, R. E. Wright Associates, Inc. (REWAI) has prepared the following report to accompany the attached topographic map showing the Glen Rock facility and its relationship to regional hydrogeology and groundwater chemistry. Information presented herein represents a summary and update of the geologic information of the information presented in the April 1987 report entitled "Remedial Investigations, Remedial Actions, and Assessment of Site Hazard Ranking Systems Score" which was prepared to address the U. S. Environmental Protection Agency's (EPA) ranking of the AMP Glen Rock facility for the National Priorities List (NPL). The information presented in this report is presented as a summary of pertinent information rather than as a substitute for the extensive documentation available concerning the site.

Regarding the AMP Glen Rock facility, the critical factor in the Hazardous Ranking Score (HRS) evaluation is the degree to which the population within a three-mile radius of the Glen Rock facility is potentially affected by contamination originating at that location. Therefore, information presented herein will focus upon the past and current extent of the volatile organic compound plume originating at the AMP plant and the maximum possible extent of impacted groundwater originating at the AMP plant, and the degree to which the groundwater supplies within a three-mile radius of the plant are threatened. Several critical points are discussed on the following pages.

3240 schoolhouse road middletown, pa 17057-3595 (717) 944-5501
fax (717) 944-5642

LOCAL AND REGIONAL GROUNDWATER HYDROLOGY

The AMP Glen Rock facility is located entirely within the drainage basin of Seakes Run, a small tributary flowing into the east branch of Codorus Creek. On a regional scale, the plant lies immediately east of the north-south trending regional drainage divide, separating the South Branch Codorus Creek and East Branch Codorus Creek drainage basins. Since shallow groundwater flow systems are largely controlled by surface topography with groundwater flow in the direction of topographic slope, the inferred direction of regional groundwater flow in the area of the AMP Glen Rock plant is toward the northeast. The Glen Rock municipal well field is nearly two miles due south of the facility.

On a local scale, groundwater flow from the area of maximum concentration at the facility is toward the south, in the direction of Seakes Run. On the southern side of Seakes Run, however, and within the Seakes Run drainage basin in general, groundwater flow is toward the north. Seakes Run is fed by groundwater discharge in the form of numerous springs located in the headwater area. Among these are the springs which feed Larkin Pond.

As is typical for the region in general, topographic highs represent groundwater recharge areas and topographically lower lying areas represent groundwater discharge areas. The occurrence of springs in the Larkin Pond area indicates an upward component of groundwater flow at this location, defining a groundwater discharge zone. Therefore, in the vicinity of the AMP Glen Rock facility, a shallow groundwater flow cell dominates the hydrogeological regime, with downward flow beneath topographic highs and upward flow beneath the topographic lows.

GROUNDWATER FLOW BARRIERS

A minimum of 6 groundwater flow barriers exist between the Glen Rock municipal well field and the AMP Glen Rock facility, a distance of over 9,000 feet (see attached map). These flow barriers are defined by groundwater/surface water drainage divides and axes for the constituent drainage basins through which surface water flows and to which groundwater base flow discharges. As stated in the Uncontrolled Hazardous Waste Site Ranking System, A Users Manual, the presence of such discontinuities eliminates the population served by wells protected by these features from consideration in the HRS process. To quote from the manual (page 25):

> "If a discontinuity in the aquifer occurs between the hazardous substance and all wells, give this factor a score of zero except where it can be shown that the contaminant is likely to migrate beyond the discontinuity."

Figure 1 compares the concept of a groundwater flow discontinuity as presented by the EPA with the actual situation observed between the AMP Glen Rock facility and the Glen Rock Borough municipal well field. Rather than a single discontinuity as presented in the EPA guidance document, six such discontinuities exist between the hazardous substance and the well field. Additionally, Pennsylvania Department of Environmental Resources (DER) sampling (see attached map for well locations) has demonstrated that contaminants have not migrated beyond any of the discontinuities, as described below. Therefore, the population served by the Glen Rock municipal well field should not be included in the HRS ranking process.

Furthermore, for the same reasons, the populations outside of the Seakes Run drainage basin, in which the AMP Glen Rock facility is located and in which the volatile organic compound plume originating at the AMP plant is wholly contained, should also not be considered in the HRS ranking process. The HRS score of 39.93 derived by NUS Corporation for the AMP Glen Rock facility was based on the population potentially affected and defined as follows:

Glen Rock Municipal Water Company	
Glen Rock Borough	- 1,568
Shrewsbury	- 388
Other Sources	
Albright Trailer Park	- 254.6
Springfield Manor Apartments	- 22.8
Homes East of the Triassic Dike	- 2,492.8
Total	4,718.2

The total population served by groundwater, as estimated by NUS, was 4,718.2, leading to a distance to the nearest well/population served matrix score of 35. Using this matrix score, a groundwater route score of 65.62 was derived.

Based on information presented herein, however, Glen Rock and Shrewsbury populations and most of the homes served by groundwater, as estimated by NUS, should not be included in the HRS ranking process as stipulated in the HRS ranking manual.

Since groundwater flow cannot cross a flow divide, such as that presented by either a ridge or valley axis, the potential for groundwater contamination originating at the AMP facility is limited to the Seakes Run drainage basin. Based on a count of

homes indicated on the USGS Glen Rock, Pennsylvania, 7 1/2-minute topographic map, the population of the Seakes Run drainage basin is approximately 250 individuals. This figure was derived by multiplying the number of houses (68) by 3.8 individuals per house. Liberally assuming that the entire population residing within the Seakes Run drainage basin, as well as the population of the Albright Trailer Park and Springfield Manor Apartments, (a total population of 535.6) is potentially threatened by contamination originating at the AMP Glen Rock facility, and that the distance to the nearest well is 0, a maximum matrix score of 20 is derived. Using this matrix value, a groundwater route total score of 43.24 results for a total HRS score of 26.64. It must be remembered that this total score of 26.64 was derived using a very conservative scenario, which is not borne out by actual site conditions. In that the trailer park is served by air-stripping towers, which represents an alternate water supply source not subject to groundwater contamination, this population should also be deleted. This value is well below the critical value of 28.5 necessary to qualify the site for NPL listing.

PLUME EXTENT

The maximum observed extent of groundwater contamination was observed in November 1984 (see Figure 2). At this time, total volatile organic concentrations exceeded 100 parts per billion (ppb) over almost all of the AMP Glen Rock site. Significant decreases in total volatile organic concentrations have been observed consistently since that time due to the implementation of a successful program of remediation which focuses upon the capture of groundwater contamination originating at the facility. By June 1988, groundwater contamination in excess of 100 ppb had diminished to an area covering less than 50 percent of the site (Figure 2).

Clearly, groundwater contamination originating at the AMP Glen Rock plant is decreasing in areal extent. Therefore, the potential to affect water supplies not yet affected is nonexistent. Furthermore, because of capture of contaminants originating at the facility and diminished plume size, water supplies which have been affected can be expected to improve significantly in the future.

During a completely separate study prompted by the detection of trichloroethylene (TCE) in a Glen Rock Borough municipal water supply spring, a regional program of groundwater sampling was implemented by the DER, Bureau of Community Environmental Control. A summary of the results of DER sampling is presented as Table 1 and DER groundwater sampling locations are plotted on the attached map. Contaminants were not detected in 9 of the

13 wells sampled. TCE and associated transformation products were detected at four of the sampled locations. Sample locations lie almost in a direct line between the AMP plant and the municipal well field.

According to Ed Shaw of the Pennsylvania DER, TCE contamination of the Fisher spring represents a localized problem due to improper handling of that substance in the immediate vicinity of the spring. TCE is not a major contaminant at the AMP Glen Rock facility and does not occur at these levels at that location. Contaminants characteristic of the AMP Glen Rock plume (1,1,2-trichloroethane and 1,1,1-trichloroethane) were not detected at any location between and including the Glen Rock municipal well field and the AMP plant. Therefore, it can be categorically stated that contamination originating from the AMP Glen Rock facility has not crossed the drainage divide separating the South Branch Codorus Creek and East Branch Codorus Creek drainage basin, and in no way poses a potential for contamination of the Glen Rock Borough municipal water supply. Furthermore, based on analyses of the Grim Glass facility's groundwater supply well, contaminants originating at the AMP Glen Rock plant have not crossed the centerline of the Seakes Run drainage basin.

MAXIMUM PLUME EXTENT

Based on the results of modeling presented in REWAI's April 1987 report, the maximum extent of detectable groundwater contamination is approximately 2,500 feet from the source area due to the effects of mixing and dispersion during transport. Model results represent an extrapolation based on the advection dispersion equation governing the rate and extent of groundwater contamination under steady-state conditions. Calculated contaminant concentration isopleths occurred within 50 feet of the observed contaminant concentration isopleths, based on data collected during March 1986. Therefore, the error of estimate is approximately 50 feet and the maximum plume extent is 2,500 +/- 50 feet. As such, only homes within 2,500 feet of the AMP plant and within the Seakes Run drainage basin are potentially threatened by contamination originating at that location. Again, excluding the population of the trailer park for which an alternate supply of groundwater is available, and including the population of the Springfield Manor Apartments, the total potentially affected population is well less than 100, for a maximum matrix score of 10 and a total HRS score of 18.79. Again, the value is significantly below the critical value of 28.5, which would qualify the site for placement on the NPL.

Other key points, as indicated on the attached map, are that a north-south trending Triassic diabase dike represents a groundwater flow barrier in that the population west of this barrier is not affected. This point was adequately addressed by NUS during the HRS ranking process. Finally, it should be noted that additional measures toward continued environmental restoration at the AMP plant are planned for the very near future. These include, but are not limited to, the installation of additional recovery wells near the contaminant source area in order to capture contaminants at the point where they are introduced to the groundwater regime, and implementation of a feasibility study focused upon expediting environmental restoration by means of enhanced recovery processes which may include soil gas extraction or soil washing by means of flushing.

We would be more than happy to discuss the information presented herein at your convenience and look forward to an equitable and just decision regarding the site by the EPA.

Very truly yours,

R. E. WRIGHT ASSOCIATES, INC.

Paul R. Miller
Project Manager

PRM:pr
Attachments

T03895-6018

Table 1

Water Quality Sampling
Glen Rock Municipal Sources

REWAI Project 86018

Source[1]	Date	Results (ppb)
1. Well 2	11/2/87	No Detection
2. Well 3	11/2/87	No Detection
3. Fisher Spring	11/2/87	TCE - 100 ppb
4. Sterner Springs	11/9/87	No Detection
5. Miller Spring	11/9/87	No Detection
6. Fisher Spring	11/9/87	TCE - 159 ppb
7. Fisher Well	11/23/87	TCE - 45 ppb
8. Grim's Glass	12/14/87	No Detection
9. Private Well A	12/14/87	No Detection
10. Private Well B	12/14/87	No Detection
11. Private Well C	3/17/88	TCE - 25 ppb
12. Private Well D	4/28/88	No Detection
13. Private Well E	4/28/88	No Detection
14. Pond F	4/28/88	trans-1,2-Dichloroethylene - 2.5 ppb cis-1,2-Dichloroethylene - 1.1 ppb

[1] Data from DER Sampling (Ed Shaw, 7/27/88 letter to REWAI).

- 2 new wells will be put in place & vacuum lysimeters to pull out the VOC's.

AMP has 1985 RI/FS gudance p. 5 reference to other PRPs - out

AMP RI/FS Needs

p. 31 line 1 typo?

- vertical migration of contaminants
- aeral extent of contamination
- pot. contaminant pathways other than $g'H_2O$
- detailed geologic maps + cross-sections
- pot. for off-site migration via wind

QA plan?

FS - contaminant source location + removal
- evalvation + selection of remedial measures not justified

RI/FS Needs:
- demographics
- meteorological info.
- natural resources
- info. about waste characteristics

ARI as PRP? p. 80
SCI
Asphalt plant

CORRECTIVE ACTION PLAN

- INTRODUCTION

- RCRA FACILITY INVESTIGATION

  - Task I: Description of Current Conditions
  - Task II: Pre-Investigation Evaluation of Corrective Measure Technologies
  - Task III: RFI Workplan Requirements
  - Task IV: Facility Investigation
  - Task V: Investigation Analysis
  - Task IV: Laboratory and Bench-Scale Studies
  - Task VII: Reports

- CORRECTIVE MEASURE STUDY

  - Task VIII: Identification and Development of the Corrective Measure Alternative or Alternatives
  - Task IX: Evaluation of the Corrective Measure Alternative or Alternatives
  - Task X: Justification and Recommendation of the Corrective Measure or Measures
  - Task XI: Reports

- CORRECTIVE MEASURE IMPLEMENTATION

  - Task XII: Corrective Measure Implementation Program Plan
  - Task XIII: Corrective Measure Design
  - Task XIV: Corrective Measure Construction
  - Task XV: Reports

INTRODUCTION

The objective of a Corrective Action Program at a hazardous waste management facility is to evaluate the nature and extent of the release of hazardous waste or constituents; to evaluate facility characteristics; and to identify, develop, and implement the appropriate corrective measure or measures adequate to protect human health and the environment. The following bullets identify components necessary to assure a complete corrective action program. It should be recognized that the detail required in each of these steps will vary depending on the facilty and its complexity:

- Locate the source(s) of the release(s) of contaminants (e.g.. regulated units, solid waste management units, and other source areas)

- Characterize the nature and extent of contamination both within the facility boundaries and migrating from the facility. This would include defining the pathways and methods of migration of the hazardous waste or constituents, including the media, extent, direction, speed, complicating factors inflencing movement, concentration profiles, etc.

- Identify areas and populations threatened by releases from the facility

- Determine short and long term, present and potential threats of releases from the facility on human health and/or the environment

- Identify and implement a interim measure or measures to abate the further spread of contaminants, control the source of contamination, or otherwise control the releases themselves

- Evaluate the overall integrity of containment structure and activities at the site intended for long-term containment

- Identify, develop, and implement a corrective measure or measures to prevent and remediate releases of hazardous waste or constituents from the facility

- Design a program to monitor the implementation, maintenance and performance of any interim or final corrective measure(s) to ensure that human health and the environment are being protected

The purpose of the Corrective Action Plan (CAP)is to aid Regions and States in determining and directing the specific work the owner/operator or respondent must perform, as part of a complete corrective action program. The Corrective Action Plan is a document specifically intended to assist Regions and States in the development of Corrective Action Orders (§ 3008(h)) and corrective action requirements in permit applications and permits (§ 3004(u)&(v)). It does so by laying out scopes of work for the three essential phases of a complete corrective action program which can be used to formulate facility-specific scopes of work for a order or permit. These three phases and their objectives are as follows:

Phase I - RCRA Facility Investigation (RFI) - to evaluate thoroughly the nature and extent of the release of hazardous waste and hazardous constituents and to gather necessary data to support the Corrective Measure Study.

Phase II - Corrective Measures Study (CMS) - to develop and evaluate corrective measure alternative or alternatives and to recommend the final corrective measure or measures.

Phase III - Corrective Measures Implementation (CMI) - to design, construct, operate, maintain and monitor the performance of the corrective measure or measures selected.

Users of the CAP should understand that it is designed to identify actions that facility owner/operator or respondent must take as part of a corrective action program. It does not identify the steps that remain the responsibility of the regulatory agency. To clarify this interaction between the facility owner/operator or respondent, Figure 1 represents the flowchart of owner/operator or respondent submittals and Agency actions for the three phases of the CAP.

The CAP scopes of work should not be considered "boilerplate." The scopes of work in the CAP are models and must be modified, enhanced or sections deleted based on site-specific situations. Information generated from investigations such such as RCRA Facility Assessments (RFAs) should be used to tailor the scope of work to address facility-specific situations. The following are some examples where site-specifics require modification to the CAP model scopes of work.

- If the contamination problem at a facility is merely a small soil contamination problem, then the CAP should be scaled down accordingly.

- In complicated contamination situations, the Health and Safety Plan and Community Relations Plans may need to be comprehensive. However, in simple contamination situations, these plans may be very brief.

- If site-specifics conditions require more detail than what has been scoped out in any particular section of the CAP, then the CAP should be enhanced accordingly.

- If there is sufficient information on a site to preclude an air release, then it would not be necessary to require the owner/operator or respondent to perform an air contamination characterization. The air contamination characterization work under the RFI (Task IV, C, 4) should be deleted.

- If interim measures are underway, scheduled or contemplated at a facility, then the Interim Measures section under the RFI (Task I, C) should be modified to specifically reference the interim measures.

- If possible, the CAP should focus the owner/operator or respondent on specific solid waste management units and other areas of interest, as well as known waste management activity areas (i.e. waste recycling units, wastewater treatment tanks).

- If only one corrective measure alternative is appropriate for a given situation, and it would not be necessary to require the owner/operator or respondent to further investigate the possibility of other corrective measure alternatives, then the scopes of work (citations) would be modified to reflect this situation.

Finally, it is necessary to stress the importance of site-specific technical detail in the development of Corrective Action Orders and corrective action permit requirements. When the scope of work is specific to the facility, it is easier to enforce. Each facility has unique characteristics and circumstances affecting it that need to be incorporated into any requirements for corrective action. Without this many owner/operators or respondents will provide us with submittals which lack the necessary information to perform a corrective measure program. In addition to providing a adequate scope of work, the Agency should also propose a site-specific time-frame for completion of the work.

SCOPE OF WORK FOR A RCRA FACILITY INVESTIGATION AT [SPECIFY FACILITY NAME]

PURPOSE

The purpose of this RCRA Facility Investigation is to determine the nature and extent of releases of hazardous waste or constituents from regulated units, solid waste management units, and other source areas at the facility and to gather all necessary data to support the Corrective Measures Study. The Respondent shall furnish all personnel, materials, and services necessary for, or incidental to, performing the RCRA remedial investigation at [specify facility name].

[NOTE: This scope of work is intended to foster timely, concise submissions by Respondent. To achieve this goal, it is important when using the model scope of work to consider facility specific conditions. This scope of work should be modified as necessary to require only that information necessary to complete the RCRA Facility Investigation.]

SCOPE

The RCRA Facility Investigation consists of seven tasks:

Task I: Description of Current Conditions

- A. Facility Background
- B. Nature and Extent of Contamination
- C. Implementation of Interim Measures

Task II: Pre-Investigation Evaluation of Corrective Measure Technologies

Task III: RFI Workplan Requirements

- A. Project Management Plan
- B. Data Collection Quality Assurance Plan
- C. Data Management Plan
- D. Health and Safety Plan
- E. Community Relations Plan

Task IV: Facility Investigation

- A. Environmental Setting
- B. Source Characterization
- C. Contamination Characterization
- D. Potential Receptor Identification

Task V: Investigation Analysis
- A. Data Analysis
- B. Protection Standards

Task VI: Laboratory and Bench-Scale Studies

Task VII: Reports
- A. Task I Report and RFI Workplan
- B. Progress
- C. Draft and Final

TASK I: DESCRIPTION OF CURRENT CONDITIONS

The Respondent shall submit for EPA approval a report providing the background information pertinent to the facility, contamination, and interim measures as set forth below. The data gathered during any previous investigations or inspections and other relevant data shall be included.

A. Facility Background

The Respondent's report shall summarize the regional location, pertinent boundary features, general facility physiography, hydrogeology, and historical use of the facility for the treatment, storage, or disposal of solid and hazardous waste. The Respondent's report shall include:

1. Map(s) depicting the following:

   a. General geographic location;

   b. Property lines, with the owners of all adjacent property clearly indicated;

   c. Topography (with a contour interval of [number] feet and a scale of 1 inch = 100 feet), waterways, all wetlands, floodplains, water features, drainage patterns;

   d. All tanks, buildings, utilities, paved areas, easements, rights-of-way, and other features;

   e. All solid or hazardous waste treatment, storage, or disposal areas active after November 19, 1980;

   f. All known past solid or hazardous waste treatment, storage, or disposal areas and all known spill, fire, or other accidental release locations regardless of whether they were active on November 19, 1980;

   g. All known past and present product and waste underground tanks or piping;

   h. Surrounding land uses (residential, commercial, agricultural, recreational); and

   i. The location of all production and ground water monitoring wells. These wells shall be clearly labeled. Ground and top of casing elevations shall be included (these elevations may be included as an attachment).

All maps shall be consistent with the requirements set forth in 40 C.F.R. § 270.14 and be of sufficient detail and accuracy to locate and report all current and future work performed at the site;

2. A history and description of ownership and operation, solid and hazardous waste generation, and treatment, storage, and disposal activities at the facility;

3. Approximate dates or periods of past product and waste spills, identification of the materials spilled, the amount spilled, the location of the spills, and a description of the response actions conducted (local, State, or Federal response units or private parties), including any inspection reports or technical reports generated as a result of the response; and

4. A summary of past permits requested and/or received, any enforcement actions and their subsequent responses.

B. Nature and Extent of Contamination

The Respondent shall prepare and submit for EPA approval a preliminary report describing the existing information on the nature and extent of contamination.

1. The Respondent's report shall summarize all possible source areas of contamination. This, at a minimum, should include all regulated units, solid waste management units, spill areas, and other suspected source areas of contamination. For each area, the Respondent shall identify the following:

   a. Location of unit/area (which shall be depicted on a facility map);

   b. Quantities of solid and hazardous wastes;

   c. Hazardous waste or hazardous constituents, to the extent known; and

   d. Identification of areas where additional information is necessary.

2. The Respondent shall prepare an assessment and description of the existing degree and extent of contamination. This should include:

a. Available monitoring data and qualitative information on locations and levels of contamination at the facility;

b. All potential migration pathways including information on geology, pedology, hydrogeology, physiography, hydrology, water quality, meterology, and air quality; and

c. The potential impact(s) on human health and the environment, including demography, ground water and surface water use, and land use.

C. Implementation of Interim Measures

The Respondent's report shall document interim measures which were or are being undertaken at the facility. This shall include:

1. Objectives of the interim measures: how the measure is mitigating a potential threat to human health and the environment and/or is consistent with and integrated into any long term solution at the facility;

2. Design, construction, operation, and maintenance requirements;

3. Schedules for design, construction, and monitoring; and

4. Schedule for progress reports.

TASK II: PRE-INVESTIGATION EVALUATION OF CORRECTIVE MEASURE TECHNOLOGIES

Prior to starting the facility investigation, the Respondent shall submit to EPA a report that identifies the potential corrective measure technologies known to Respondent at the time of report submittal that may be used on-site or off-site for the containment, treatment, remediation, and/or disposal of contamination. This report shall also identify any field, laboratory, bench- or pilot-scale data that needs to be collected in the facility investigation to facilitate the evaluation and selection of the final corrective measure or measures (e.g., compatibility of waste and construction materials, information to evaluate effectiveness, treatability of wastes, etc.).

TASK III: RFI WORKPLAN REQUIREMENTS

The Respondent shall prepare a RCRA Facility Investigation Workplan. This RFI Workplan shall include the development of several plans, which shall be prepared concurrently. During the RCRA Facility Investigation, it may be necessary to revise the RFI Workplan to increase or decrease the detail of information collected to accomodate the facility specific situation. The RFI Workplan shall include the following:

A. Project Management Plan

The Respondent shall prepare a Project Management Plan which will include a discussion of the technical approach, schedules, budget, and personnel. The Project Management Plan will also include a description of qualifications of personnel performing or directing the RFI, including contractor personnel. This plan shall also document the overall management approach to the RCRA Facility Investigation.

B. Data Collection Quality Assurance Plan

The Respondent shall prepare a plan to document all monitoring procedures: sampling, field measurements and sample analysis performed during the investigation to characterize the environmental setting, source, and contamination, so as to ensure that all information, data and resulting decisions are technically sound, statistically valid, and properly documented.

1. Data Collection Strategy

The strategy section of the Data Collection Quality Assurance Plan shall include, but not be limited to, the following:

a. Description of the intended uses for the data, and the necessary level of precision and accuracy for these intended uses;

b. Description of methods and procedures to be used to assess the precision, accuracy, and completeness of the measurement data;

c. Description of the rationale used to assure that the data accurately and precisely represent a characteristic of a population, parameter variations at a sampling point, a process condition, or an environmental condition. Examples of factors which shall be considered and discussed include:

i) Environmental conditions at the time of sampling;

ii) Number of sampling points;

iii) Representativeness of selected media; and

iv) Representativeness of selected analytical parameters.

d. Description of the measures to be taken to assure that the following data sets can be compared to each other:

i) RFI data generated by the Respondent over some time period;

ii) RFI data generated by an outside laboratory or consultant versus data generated by the Respondent;

iii) Data generated by separate consultants or laboratories; and

iv) Data generated by an outside consultant or laboratory over some time period.

e. Details relating to the schedule and information to be provided in quality assurance reports. The reports should include, but not be limited to:

i) Periodic assessment of measurement data accuracy, precision, and completeness;

ii) Results of performance audits;

iii) Results of system audits;

iv) Significant quality assurance problems and recommended solutions; and

v) Resolutions of previously stated problems.

2. Sampling

The Sampling section of the Data Collection Quality Assurance Plan shall discuss:

a. Selecting appropriate sampling locations, depths, etc.;

b. Providing a statistically sufficient number of sampling sites;

c. Measuring all necessary ancillary data;

d. Determining conditions under which sampling should be conducted;

e. Determining which media are to be sampled (e.g., ground water, air, soil, sediment, etc.);

f. Determining which parameters are to be measured and where;

g. Selecting the frequency of sampling and length of sampling period;

h. Selecting the types of sample (e.g., composites vs. grabs) and number of samples to be collected;

i. Documenting field sampling operations and procedures, including;

   i) Documentation of procedures for preparation of reagents or supplies which become an integral part of the sample (e.g., filters, and adsorbing reagents);

   ii) Procedures and forms for recording the exact location and specific considerations associated with sample acquisition;

   iii) Documentation of specific sample preservation method;

   iv) Calibration of field devices;

   v) Collection of replicate samples;

   vi) Submission of field-biased blanks, where appropriate;

   vii) Potential interferences present at the facility;

   viii) Construction materials and techniques, associated with monitoring wells and piezometers;

   ix) Field equipment listing and sample containers;

x) Sampling order; and

xi) Decontamination procedures.

j. Selecting appropriate sample containers;

k. Sample preservation; and

l. Chain-of-custody, including:

i) Standardized field tracking reporting forms to establish sample custody in the field prior to shipment; and

ii) Pre-prepared sample labels containing all information necessary for effective sample tracking.

3. Field Measurements

The Field Measurements section of the Data Collection Quality Assurance Plan shall discuss:

a. Selecting appropriate field measurement locations, depths, etc.;

b. Providing a statistically sufficient number of field measurements;

c. Measuring all necessary ancillary data;

d. Determining conditions under which field measurement should be conducted;

e. Determining which media are to be addresssed by appropriate field measurements (e.g., ground water, air, soil, sediment, etc.);

f. Determining which parameters are to be measured and where;

g. Selecting the frequency of field measurement and length of field measurements period; and

h. Documenting field measurement operations and procedures, including:

i) Procedures and forms for recording raw data and the exact location, time, and facility-specific considerations associated with the data acquisition;

ii) Calibration of field devices;

iii) Collection of replicate measurements;

iv) Submission of field-biased blanks, where appropriate;

v) Potential interferences present at the facility;

vi) Construction materials and techniques associated with monitoring wells and piezometers used to collect field data;

vii) Field equipment listing;

viii) Order in which field measurements were made; and

ix) Decontamination procedures.

4. Sample Analysis

The Sample Analysis section of the Data Collection Quality Assurance Plan shall specify the following:

a. Chain-of-custody procedures, including:

i) Identification of a responsible party to act as sample custodian at the laboratory facility authorized to sign for incoming field samples, obtain documents of shipment, and verify the data entered onto the sample custody records;

ii) Provision for a laboratory sample custody log consisting of serially numbered standard lab-tracking report sheets; and

iii) Specification of laboratory sample custody procedures for sample handling, storage, and dispersement for analysis.

b. Sample storage;

c. Sample preparation methods;

d. Analytical procedures, including:

i) Scope and application of the procedure;

ii) Sample matrix;

iii) Potential interferences;

iv) Precision and accuracy of the methodology; and

v) Method detection limits.

e. Calibration procedures and frequency;

f. Data reduction, validation, and reporting;

g. Internal quality control checks, laboratory performance and systems audits and frequency, including:

i) Method blank(s);

ii) Laboratory control sample(s);

iii) Calibration check sample(s);

iv) Replicate sample(s);

v) Matrix-spiked sample(s);

vi) "Blind" quality control sample(s);

vii) Control charts;

viii) Surrogate samples;

ix) Zero and span gases; and

x) Reagent quality control checks.

[A performance audit will be conducted by EPA on the laboratories selected by the Respondent. This audit must be completed and approved prior to the facility investigation.]

h. Preventive maintenance procedures and schedules;

i. Corrective action (for laboratory problems); and

j. Turnaround time.

C. Data Management Plan

The Respondent shall develop and initiate a Data Manage-

ment Plan to document and track investigation data and results. This plan shall identify and set up data documentation materials and procedures, project file requirements, and project-related progress reporting procedures and documents. The plan shall also provide the format to be used to present the raw data and conclusions of the investigation.

1. Data Record

   The data record shall include the following:

   a. Unique sample or field measurement code;

   b. Sampling or field measurement location and sample or measurement type;

   c. Sampling or field measurement raw data;

   d. Laboratory analysis ID number;

   e. Property or component measured; and

   f. Result of analysis (e.g., concentration).

2. Tabular Displays

   The following data shall be presented in tabular displays:

   a. Unsorted (raw) data;

   b. Results for each medium, or for each constituent monitored;

   c. Data reduction for statistical analysis;

   d. Sorting of data by potential stratification factors (e.g., location, soil layer, topography); and

   e. Summary data.

3. Graphical Displays

   The following data shall be presented in graphical formats (e.g., bar graphs, line graphs, area or plan maps, isopleth plots, cross-sectional plots or transects, three dimensional graphs, etc.):

a. Display sampling location and sampling grid;

b. Indicate boundaries of sampling area, and areas where more data are required;

c. Display levels of contamination at each sampling location;

d. Display geographical extent of contamination;

e. Display contamination levels, averages, and maxima;

f. Illustrate changes in concentration in relation to distance from the source, time, depth, or other parameters; and

g. Indicate features affecting intramedia transport and show potential receptors.

D. Health and Safety Plan

The Respondent shall prepare a facility Health and Safety Plan.

1. Major elements of the Health and Safety Plan shall include:

a. Facility description including availability of resources such as roads, water supply, electricity, and telephone service;

b. Description of the known hazards and evaluations of the risks associated with the incident and with each activity conducted;

c. List of key personnel and alternates responsible for site safety, responses operations, and for protection of public health;

d. Delineation of work area;

e. Description of levels of protection to be worn by personnel in work area;

f. Establishment of procedures to control site access;

g. Description of decontamination procedures for personnel and equipment;

h. Establishment of site emergency procedures;

i. Emergency medical care for injuries and toxicological problems;

j. Description of requirements for an environmental surveillance program;

k. Routine and special training required for responders; and

l. Establishment of procedures for protecting workers from weather-related problems.

2. The Facility Health and Safety Plan shall be consistent with:

a. NIOSH Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities (1985);

b. EPA Order 1440.1 - Respiratory Protection;

c. EPA Order 1440.3 - Health and Safety Requirements for Employees engaged in Field Activities;

d. Facility Contingency Plan;

e. EPA Standard Operating Safety Guide (1984);

f. OSHA regulations particularly in 29 C.F.R. 1910 and 1926;

g. State and local regulations; and

h. Other EPA guidance as provided.

E. Community Relations Plan

The Respondent shall prepare a plan, for the dissemination of information to the public regarding investigation activities and results.

TASK IV: FACILITY INVESTIGATION

The Respondent shall conduct those investigations necessary to: characterize the facility (Environmental Setting); define the source (Source Characterization) define the degree and extent of contamination (Contamination Characterization); and identify actual or potential receptors.

The investigations should result in data of adequate technical quality to support the development and evaluation of the corrective measure alternative or alternatives during the Corrective Measures Study.

The site investigation activities shall follow the plans set forth in Task III. All sampling and analyses shall be conducted in accordance with the Data Collection Quality Assurance Plan. All sampling locations shall be documented in a log and identified on a detailed site map.

A. Environmental Setting

The Respondent shall collect information to supplement and verify existing information on the environmental setting at the facility. The Respondent shall characterize the following:

1. Hydrogeology

The Respondent shall conduct a program to evaluate hydrogeologic conditions at the facility. This program shall provide the following information:

a. A description of the regional and facility specific geologic and hydrogeologic characteristics affecting ground water flow beneath the facility, including:

i) Regional and facility specific stratigraphy: description of strata including strike and dip, identification of stratigraphic contacts;

ii) Structural geology: description of local and regional structural features (e.g., folding, faulting, tilting, jointing, etc.);

iii) Depositional history;

iv) Identification and characterization of areas and amounts of recharge and discharge;

v) Regional and facility specific ground water flow patterns; and

vi) Characterize seasonal variations in the ground water flow regime.

b. An analysis of any topographic features that might influence the ground water flow system. (Note: Stereographic analysis of aerial photographs may aid in this analysis.)

c. Based on field data, tests, and cores, a representative, and accurate classification and description of the hydrogeologic units which may be part of the migration pathways at the facility (i.e., the aquifers and any intervening saturated and unsaturated units), including:

   i) Hydraulic conductivity and porosity (total and effective);

   ii) Lithology, grain size, sorting, degree of cementation;

   iii) An interpretation of hydraulic interconnections between saturated zones; and

   iv) The attenuation capacity and mechanisms of the natural earth materials (e.g., ion exchange capacity, organic carbon content, mineral content etc.).

d. Based on field studies and cores, structural geology and hydrogeologic cross sections showing the extent (depth, thickness, lateral extent) of hydrogeologic units which may be part of the migration pathways, identifying:

   i) Sand and gravel deposits in unconsolidated deposits;

   ii) Zones of fracturing or channeling in consolidated or unconsolidated deposits;

   iii) Zones of high permeability or low permeability that might direct and/or restrict the flow of contaminants;

   iv) The uppermost aquifer: geologic formation, group of formations, or part of a formation capable of yielding a significant amount of ground water to wells or springs; and

   v) Water-bearing zones above the first confining layer that may serve as a pathway for contaminant migration, including perched zones of saturation.

e. Based on data obtained from ground water monitoring wells and piezometers installed upgradient and downgradient of the potential contaminant source, a representative description of water level or fluid pressure monitoring, including:

   i) Water-level contour and/or potentiometric maps;

   ii) Hydrologic cross-sections showing vertical gradients;

   iii) The flow system, including the vertical and horizontal components of flow; and

   iv) Any temporal changes in hydraulic gradients, for example, due to tidal or seasonal influences.

f. A description of man made influences that may affect the hydrogeology of the site, identifying:

   i) Active and inactive local water supply and production wells with an approximate schedule of pumping; and

   ii) Manmade hydraulic structures (pipelines, french drains, ditches, unlined ponds, septic tanks, NPDES outfalls, retention areas, etc.).

2. Soils

The Respondent shall conduct a program to characterize the soil and rock units above the water table in the vicinity of the contaminant release(s). Such characterization shall include, but not be limited to, the following information:

a. Soil Conservation Service (SCS) soil classification;
b. Surface soil distribution;
c. Soil profile, including American Standard Test Method (ASTM) classification of soils;
d. Transects of soil stratigraphy;
e. Hydraulic conductivity (saturated and unsaturated);
f. Relative permeability;
g. Bulk density;
h. Porosity;
i. Soil sorptive capacity;
j. Cation exchange capacity (CEC);
k. Soil organic content;
l. Soil pH;

m. Particle size distribution;
n. Depth of water table;
o. Moisture content;
p. Effect of stratification on unsaturated flow;
q. Infiltration
r. Evapotranspiration;
s. Storage capacity;
t. Vertical flow rate; and
u. Mineral content.

3. Surface Water and Sediment

The Respondent shall conduct a program to characterize the surface water bodies in the vicinity of the facility. Such characterization shall include, but not be limited to, the following activities and information:

a. Description of the temporal and permanent surface water bodies including:

i) For lakes and estuaries: location, elevation, surface area, inflow, outflow, depth, temperature stratification, and volume;

ii) For impoundments: location, elevation, surface area, depth, volume, freeboard, and purpose of impoundment;

iii) For streams, ditches, and channels: location, elevation, flow, velocity, depth, width, seasonal fluctuations, and flooding tendencies (i.e., 100 year event);

iv) Drainage patterns; and

v) Evapotranspiration.

b. Description of the chemistry of the natural surface water and sediments. This includes determining the pH, total dissolved solids, total suspended solids, biological oxygen demand, alkalinity, conductivity, dissolved oxygen profiles, nutrients (NH_3, NO_3^-/NO_2^-, PO_4^{-3}), chemical oxygen demand, total organic carbon, specific contaminant concentrations, etc.

c. Description of sediment characteristics including:

i) Deposition area;

ii) Thickness profile; and

i) Sorption;

ii) Biodegradability, biocentration, biotransformation;

iii) Photodegradation rates;

iv) Hydrolysis rates; and

v) Chemical transformations.

The Respondent shall document the procedures used in making the above determinations.

C. Contamination Characterization

The Respondent shall collect analytical data on ground water, soils, surface water, sediment, and subsurface gas contamination in the vicinity of the facility. This data shall be sufficient to define the extent, origin, direction, and rate of movement of contaminant plumes. Data shall include time and location of sampling, media sampled, concentrations found, conditions during sampling, and the identity of the individuals performing the sampling and analysis. The Respondent shall address the following types of contamination at the facility:

1. Ground Water Contamination

The Respondent shall conduct a Ground Water Investigation to characterize any plumes of contamination at the facility. This investigation shall, at a minimum, provide the following information:

a. A description of the horizontal and vertical extent of any immiscible or dissolved plume(s) originating from the facility;

b. The horizontal and vertical direction of contamination movement;

c. The velocity of contaminant movement;

d. The horizontal and vertical concentration profiles of "Appendix VIII constituents" (see 40 C.F.R. Part 261, App. VIII) in the plume(s);

e. An evaluation of factors influencing the plume movement; and

f. An extrapolation of future contaminant movement.

The Respondent shall document the procedures used to characterize contaminant plume(s), for example, geophysics, modeling, pump tests, slug tests, nested piezometers, etc.

2. Soil Contamination

The Respondent shall conduct an investigation to characterize the contamination of the soil and rock units above the water table in the vicinity of the contaminant release. The investigation shall include the following information:

a. A description of the vertical and horizontal extent of contamination;

b. A description of contaminant and soil chemical properties within the contaminant source area and plume. This includes contaminant solubility, speciation, adsorption, leachability, exchange capacity, biodegradability, hydrolysis, photolysis, oxidation, and other factors that might affect contaminant migration and transformation;

c. Specific contaminant concentrations;

d. The velocity and direction of contaminant movement; and

e. An extrapolation of future contaminant movement.

The Respondent shall document the procedures used in making the above determinations.

3. Surface Water and Sediment Contamination

The Respondent shall conduct a surface water investigation to characterize contamination in surface water bodies resulting from contaminant releases at the facility.

The investigation shall include, but not be limited to, the following information:

a. A description of the horizontal and vertical extent of any immisicible or dissolved plume(s) originating from the facility, and the extent of contamination in underlying sediments;

b. The horizontal and vertical direction of contaminant movement;

c. The contaminant velocity;

d. An evaluation of the physical, biological, and chemical factors influencing contaminant movement;

e. An extrapolation of future contaminant movement; and

f. A description of the chemistry of the contaminated surface waters and sediments. This includes determining the pH, total dissolved solids, specific contaminant concentrations, etc.

The Respondent shall document the procedures used in making the above determinations.

4. Air Contamination

The Respondent shall conduct an investigation to characterize the participate and gaseous contaminants released into the atmosphere. This investigation shall provide the following information:

a. A description of the horizontal and vertical and velocity of contaminant movement;

b. The rate and amount of the release; and

c. The chemical and physical composition of the contaminants(s) released, including horizontal and vertical concentration profiles.

The Respondent shall document the procedures used in making the above determinations.

5. Subsurface Gas Contamination

The Respondent shall conduct an investigation to characterize subsurface gases emitted from buried hazardous waste and hazardous constituents in the ground water. This investigation shall include the following information:

a. A description of the horizontal and vertical extent of subsurface gases mitigation;

b. The chemical composition of the gases being emitted;

c. The rate, amount, and density of the gases being emitted and

d. Horizontal and vertical concentration profiles of the subsurface gases emitted.

The Respondent shall document the procedures used in making the above determinations.

D. Potential Receptors

The Respondent shall collect data describing the human populations and environmental systems that are susceptible to contaminant exposure from the facility. Chemical analysis of biological samples may be needed. Data on observable effects in ecosystems may also be obtained. The following characteristics shall be identified:

1. Local uses and possible future uses of ground water:

   a. Type of use (e.g., drinking water source: municipal or residential, agricultural, domestic/non-potable, and industrial); and

   b. Location of ground water users, including wells and discharge areas.

2. Local uses and possible future uses of surface waters draining the facility:

   a. Domestic and municipal (e.g., potable and lawn/garden watering);
   b. Recreational (e.g., swimming, fishing);
   c. Agricultural;
   d. Industrial; and
   e. Environmental (e.g., fish and wildlife propagation).

3. Human use of or access to the facility and adjacent lands, including, but not limited to:

   a. Recreation;
   b. Hunting;
   c. Residential;
   d. Commercial;
   e. Zoning; and
   f. Relationship between population locations and prevailing wind direction.

4. A description of the biota in surface water bodies on, adjacent to, or affected by the facility.

5. A description of the ecology overlying and adjacent to the facility.

6. A demographic profile of the people who use or have access to the facility and adjacent land, including, but not limited to: age, sex, and sensitive subgroups.

7. A description of any endangered or threatened species near the facility.

TASK V: INVESTIGATION ANALYSIS

The Respondent shall prepare an analysis and summary of all facility investigations and the results of such investigations. The objective of this task shall be to ensure that the investigation data are sufficient in quality (e.g., quality assurance procedures have been followed) and quantity to describe the nature and extent of contamination, potential threat to human health and/or the environment, and to support the Corrective Measures Study.

A. Data Analysis

The Respondent shall analyze all facility investigation data outlined in Task IV "FACILITY INVESTIGATION", and prepare a report on the type and extent of contamination at the facility, including sources and migration pathways. The report shall describe the extent of contamination (qualitative/quantitative) in relation to background levels indicative of the area.

B. Protection Standards [where applicable]

1. Ground Water Protection Standards

For regulated units the Respondent shall provide information to support the Agency's selection/development of Ground Water Protection Standards for all of the Appendix VIII constituents found in the ground water during the Facility Investigation (Task IV).

a. The Ground Water Protection Standards shall consist of:

i) the Maximum Contaminant Level (MCL) for any constituents with an EPA promulgated Maximum Contaminant Level (MCL), if the background level of the constituent is below the value of the EPA approved MCL; or

ii) the background level of that constituent in the ground water; or

iii) an EPA approved Alternate Concentration Limit (ACL).

b. Information to support the EPA's selection of Alternate Concentration Limits (ACLs) shall be developed by the Respondent in accordance with applicable EPA guidance. For any proposed ACLs the Respondent shall include a justification based upon the criteria set forth in 40 C.F.R. § 264.94(b).

c. Within [insert number] calendar days of receipt of any pro posed ACLs, the EPA shall notify the Respondent, in writing, of approval, disapproval or modifications. The EPA shall specify, in writing, the reason(s) for any disapproval or modification.

d. Within [insert number] calendar days of receipt of the EPA's notification of disapproval of any proposed ACLs, the Respondent shall amend and submit revisions to the EPA.

2. Other Relevant Protection Standards

The Respondent shall identify all relevant and applicable standards for the protection of human health and the environment (e.g., National Ambient Air Quality Standards, Federally-approved state water quality standards, etc.).

TASK VI: LABORATORY AND BENCH-SCALE STUDIES

Based on the EPA approved report submitted pursuant to Task II of this order: the Respondent shall conduct laboratory and/or bench scale studies to determine the applicability of a corrective measure technology or technologies to facility conditions. The Respondent shall analyze the technologies, based on literature review, vendor contracts, and past experience to determine the testing requirements.

The Respondent shall develop a testing plan identifying the types(s) and goal(s) of the study(ies), the level of effort needed, and the procedures to be used for data management and interpretation.

Upon completion of the testing, the Respondent shall evaluate the testing results to assess the technology or technologies with respect to the site-specific questions identified in the test plan.

The Respondent shall prepare a report summarizing the testing program and its results, both positive and negative.

TASK VII: REPORTS

A. Preliminary(Task I) and RFI Workplan

The Respondent shall submit to the EPA reports on Tasks I and II when it submits the RCRA Facility Investigation Workplan (Task III).

B. Progress

The Respondent shall, at a minimum, provide the EPA with signed, [monthly, bimonthly] progress reports containing:

1. A description and estimate of the percentage of the RFI completed;

2. Summaries of all findings;

3. Summaries of all changes made in the RFI during the reporting period;

4. Summaries of all contacts with representatives of the local community, public interest groups or state government during the reporting period;

5. Summaries of all problems or potential problems encountered during the reporting period;

6. Actions being taken to rectify problems;

7. Changes in personnel during the reporting period;

8. Projected work for the next reporting period; and

9. Copies of daily reports, inspection reports, laboratory/monitoring data, etc.

C. Draft and Final

Upon EPA approval, the Respondent shall prepare a RCRA Facility Investigation Report to present Tasks IV-V. The RCRA Facility Investigation Report shall be developed in draft form for EPA review. The RCRA Facility Investigation Report shall be developed in final format, incorporating comments received on the Draft RCRA Facility Investigation Report. Task VI shall be submitted as a separate report when the Final RCRA Facility Investigation Report is submitted.

[number] copies of all reports, including the Task I report, Task II report, Task III workplan, Task VI report

and both the Draft and Final RCRA Facility Investigation Reports (Tasks IV-V) shall be provided by the Respondent to EPA.

[THE FOLLOWING FACILITY SUBMISSION SUMMARY MAY BE PLACED IN THE BODY OF THE ORDER OR PERMIT AND REMOVED FROM THE SCOPE OF WORK. NOT ALL OF THE ITEMS LISTED BELOW MAY BE REQUIRED AT EACH FACILITY.]

Facility Submission Summary

A summary of the information reporting requirements contained in the RCRA Facility Investigation Scope of Work is presented below:

Facility Submission	Due Date
Description of Current Situation (Task I)	[DATE]
Pre-Investigation Evaluation of Corrective Measure Technologies (Task II)	[DATE]
RFI Workplan (Task III)	[DATE]
Draft RFI Report (Tasks IV and V)	[NUMBER] days after RFI Workplan Approval
Final RFI Report (Tasks IV and V)	[NUMBER] days after EPA comment on Draft RFI Report
Laboratory and Bench-Scale Studies (Task VI)	Concurrent with Final RFI Report
Progress Reports on Tasks I through VI	[MONTHLY, BI-MONTHLY]

SCOPE OF WORK FOR A CORRECTIVE MEASURE STUDY AT [SPECIFY FACILITY NAME]

PURPOSE

The purpose of this Corrective Measure Study ("CMS") is to develop and evaluate the corrective action alternative or alternatives and to recommend the corrective measure or measures to be taken at [specify facility name]. The Respondent shall furnish the personnel, materials, and services necessary to prepare the corrective measure study, except as otherwise specified.

[Note: This scope of work is intended to foster timely, concise submissions by Respondent. To achieve this goal, it is important when using the model scope of work to consider facility specific conditions. This scope should be modified as necessary to require only that information necessary to complete the Corrective Measure Study.]

SCOPE

The Corrective Measure Study consists of four tasks:

Task VIII: Identification and Development of the Corrective Measure Alternative or Alternatives

- A. Description of Current Situation
- B. Establishment of Corrective Action Objectives
- C. Screening of Corrective Measures Technologies
- D. Identification of the Corrective Measure Alternative or Alternatives

Task IX: Evaluation of the Corrective Measure Alternative or Alternatives

- A. Technical/Environmental/Human Health/Institutional
- B. Cost Estimate

Task X: Justification and Recommendation of the Corrective Measure or Measures

- A. Technical
- B. Environmental
- C. Human Health

Task XI: Reports

- A. Progress
- B. Draft
- C. Final

TASK VIII: IDENTIFICATION AND DEVELOPMENT OF THE CORRECTIVE ACTION ALTERNATIVE OR ALTERNATIVES

Based on the results of the RCRA Facility Investigation and consideration of the identified Preliminary Corrective Measure Technologies (Task II), the Respondent shall identify, screen and develop the alternative or alternatives for removal, containment, treatment, and/or other remediation of the contamination based on the objectives established for the corrective action.

A. Description of Current Situation

The Respondent shall submit an update to the information describing the current situation at the facility and the known nature and extent of the contamination as documented by the RCRA Facility Investigation Report. The Respondent shall provide an update to information presented in Task I of the RFI, "DESCRIPTION OF CURRENT CONDITIONS," to the Agency regarding previous response activities and any interim measures which have or are being implemented at the facility. The Respondent shall also make a facility-specific statement of the purpose for the response, based on the results of the RCRA Facility Investigation. The statement of purpose should identify the actual or potential exposure pathways that should be addressed by corrective measures.

B. Establishment of Corrective Action Objectives

The Respondent, in conjunction with the EPA, shall establish site specific objectives for the corrective action. These objectives shall be based on public health and environmental criteria, information gathered during the RCRA Facility Investigation, EPA guidance, and the requirements of any applicable Federal statutes. At a minimum, all corrective actions concerning ground water releases from regulated units must be consistent with, and as stringent as, those required under 40 C.F.R. § 264.100.

C. Screening of Corrective Measure Technologies

The Respondent shall review the results of the RCRA Facility Investigation and reassess the technologies specified in the Task II report as approved by EPA and identify additional technologies which are applicable at the facility. The Respondent shall screen the preliminary corrective measure technologies identified in Task II of the RCRA Facility investigation and any supplemental technologies to eliminate those that may prove infeasible to implement, that rely on technologies unlikely to perform satisfactorily or reliably, or that

do not achieve the corrective measure objective within a reasonable time period. This screening process focuses on eliminating those technologies which have severe limitations for a given set of waste and site-specific conditions. The screening step may also eliminate technologies based on inherent technology limitations. Site, waste, and technology characteristics which are used to screen inapplicable technologies are described in more detail below:

1. Site Characteristics

   Site data should be reviewed to identify conditions that may limit or promote the use of certain technologies. The use of technologies which are clearly precluded by site characteristics should be eliminated from further consideration;

2. Waste Characteristics

   Waste characteristics particularly affect the feasibility of remediating waste by utilizing in-situ methods, direct treatment methods, or land disposal (on/off-site) methods. Therefore, identification of waste characteristics that limit the effectiveness or feasibility of remediating technologies is an important part of the screening process. Remediating technologies clearly limited by these waste characteristics should be eliminated from consideration.

3. Technology Limitations

   During the screening process, the level of technological development, performance record, and inherent construction, operation, and maintenance problems should be identified for each technology considered. Technologies that are unreliable, perform poorly, or are not fully demonstrated may be eliminated in the screening process. For example, certain treatment methods have been developed to a point where they can be implemented in the field without extensive technology transfer or development.

D. <u>Identification of the Corrective Measure Alternative or Alternatives</u>

The Respondent shall develop the corrective measure alternative or alternatives based on the corrective action objectives and analysis of Preliminary Corrective Measure Technologies, as presented in Task II of the RCRA Facility investigation and as supplemented following the prepara-

tion of the RFI Report. The Respondent shall rely on engineering practice to determine which of the previously identified technologies appear most suitable for the site. Technologies can be combined to form the overall corrective action alternative or alternatives. The alternative or alternatives developed should represent a workable number of option(s) that each appear to adequately address all site problems and corrective action objectives. Each alternative may consist of an individual technology or a combination of technologies. The Respondent shall document the reasons for excluding technologies, identified in Task II, as supplemented in the development of the alternative or alternatives.

TASK IX: EVALUATION OF THE CORRECTIVE MEASURE ALTERNATIVE OR ALTERNATIVES

The Respondent shall describe each corrective measure alternative that passes through the initial screening in Task VIII and evaluate each corrective measure alternative and its components. The evaluation shall be based on technical, environmental, human health, and institutional concerns. The Respondent shall also develop cost estimates of each corrective measure.

A. Technical/Environmental/Human Health/Institutional

The Respondent shall provide a description of each corrective measure alternative which includes, but is not limited to, the following: preliminary process flow sheets; preliminary sizing and type of construction for buildings and structures; and rough quantities of utilities required. The Respondent shall evaluate each alternative in the following four areas:

1. Technical:

   The Respondent shall evaluate each corrective measure alternative based on performance, reliability, implementability, and safety.

   a. The Respondent shall evaluate performance based on the effectiveness and useful life of the corrective measure:

      i) Effectiveness shall be evaluated in terms of the ability to perform intended functions, such as containment, diversion, removal, destruction, or treatment. The effectiveness of each corrective measure shall be determined either through design specifications or by

performance evaluation. Any specific waste or site characteristics which could potentially impede effectiveness shall be considered. The evaluation should also consider the effectiveness of combinations of technologies; and

ii) Useful life is defined as the length of time the level of effectiveness can be maintained. Most corrective measure technologies, with the exception of destruction, deteriorate with time. Often, deterioration can be slowed through proper system operation and maintenance, but the technology eventually may require replacement. Each corrective measure shall be evaluated in terms of the projected service lives of its component technologies. Resource availability in the future life of the technologies, as well as appropriateness of the technologies, must be considered in estimating the useful life of the project.

b. The Respondent shall provide information on the reliability of each corrective measure, including their operation and maintenance requirements and their demonstrated reliability:

i) Operation and maintenance requirements include the frequency and complexity of necessary operation and maintenance. Technologies requiring frequent or complex operation and maintenance activities should be regarded as less reliable than technologies requiring little or straightforward operation and maintenance. The availability of labor and materials to meet these requirements shall also be considered; and

ii) Demonstrated and expected reliability is a way of measuring the risk and effect of failure. The Respondent should evaluate whether the technologies have been used effectively under analogous conditions; whether the combination of technologies has been used effectively; whether failure of any one technology has an immediate impact on receptors; and whether the corrective measure has the flexibility to deal with uncontrolable changes at the site.

c. The Respondent shall describe the implementability of each corrective measure, including the relative ease of installation (constructability) and the time required to achieve a given level of response:

i) Constructability is determined by conditions both internal and external to the facility conditions and include such items as location of underground utilities, depth to water table, heterogeneity of subsurface materials, and location of the facility (i.e., remote location vs. a congested urban area). The Respondent shall evaluate what measures can be taken to facilitate construction under these conditions. External factors which affect implementation include the need for special permits or agreements, equipment availability, and the location of suitable off site treatment or disposal facilities; and

ii) Time has two components that shall be addressed: the time it takes to implement a corrective measure, and the time it takes to actually obtain beneficial results. Beneficial results are defined as the reduction of contaminants to some acceptable, pre-established level.

d. The Respondent shall evaluate each corrective measure alternative with regard to safety. This evaluation shall include threats to the safety of nearby communities and environments, as well as those to the safety of workers during implementation. Factors to consider include, but are not limited to, fire, explosion, and exposure to hazardous substances.

2. Environmental:

The Respondent shall perform an Environmental Assessment for each alternative. The Environmental Assessment shall focus on the facility conditions and pathways of contamination actually addressed by each alternative. The Environmental Assessment for each alternative will include, at a minimum, an evaluation of: the short- and long-term beneficial and adverse effects of the response alternative; any adverse effects on environmentally sensitive areas; and an analysis of measures to mitigate adverse effects.

3. Human Health:

The Respondent shall assess each alternative in terms of the extent of which it mitigates short- and long-term potential exposure to any residual contamination and protects human health, both during and after implementation of the corrective measure. The assessment will describe the levels and characterizations of contaminants on site, potential exposure routes, and potentially affected populations. Each alternative will be evaluated to determine the level of exposure to contaminants and its reduction over time. For management of mitigation measures, the relative reduction of impact will be determined by comparing residual levels of each alternative with existing criteria, standards, or guidelines acceptable to EPA.

4. Institutional:

The Respondent shall assess relevant institutional needs for each alternative. Specifically, the effects of Federal, State, and local environmental and public health standards, regulations, guidance, advisories, ordinances, or community relations, including requirements for construction and operating permits on the design, operation, and timing of each alternative.

B. Cost Estimate

The Respondent shall develop an estimate of the cost of each corrective measure alternative (and for each phase or segment of the alternative). The cost estimate shall include both capital and operation and maintenance costs.

1. Capital costs consist of direct (construction) and indirect (nonconstruction and overhead) costs.

   a. Direct capital costs include:

      i) Construction costs: Costs of materials, labor (including fringe benefits and worker's compensation), and equipment required to install the corrective measure;

      ii) Equipment costs: Costs of treatment, containment, disposal, and/or service equipment necessary to implement the action;

      iii) Land and site-development costs: Expenses associated with purchase of land and development of existing property; and

iv) Buildings and services costs: Costs of process and nonprocess buildings, utility connections, purchased services, and disposal costs.

b. Indirect capital costs include:

i) Engineering expenses: Costs of administration, design, construction supervision, drafting, and testing of corrective measure alternatives;

ii) Legal fees and license or permit costs: Administrative and technical costs necessary to obtain licenses and permits for installation and operation;

iii) Startup and problem solving immediately following startup(skakedown) costs: Costs incurred during corrective measure startup; and

iv) Contingency allowances: Funds to cover costs resulting from unforeseen circumstances, such as adverse weather conditions, strikes and inadequate facility characterization.

2. Operation and maintenance costs are post-construction costs necessary to ensure continued effectiveness of a corrective measure. The Respondent shall consider the following operation and maintenance cost components:

a. Operating labor costs: Wages, salaries, training, overhead, and fringe benefits associated with the labor needed for post-construction operations;

b. Maintenance materials and labor costs: Costs for labor, parts, and other resources required for routine maintenance of facilities and equipment;

c. Auxiliary materials and energy: Costs of items such as chemicals and electricity for treatment plant operations, water and sewer service, and fuel;

d. Purchased services: Sampling costs, laboratory fees, and professional fees for which the need can be predicted;

e. Disposal and treatment costs: Costs of transporting, treating, and disposing of waste materials, such as treatment plant residues, generated during operations;

f. Administrative costs· Costs associated with administration of corrective measure operation and maintenance not included under other categories;

g. Insurance, taxes, and licensing costs: Costs of such items as liability and sudden accident insurance; real estate taxes on purchased land or rights-of-way; licensing fees for certain technologies; and permit renewal and reporting costs;

h. Maintenance reserve and contingency funds: Annual payments into escrow funds to cover (1) costs of anticipated replacement or rebuilding of equipment and (2) any large unanticipated operation and maintenance costs; and

i. Other costs: Items that do not fit any of the above categories.

TASK X: JUSTIFICATION AND RECOMMENDATION OF THE CORRECTIVE MEASURE OR MEASURES

The Respondent shall justify and recommend a corrective measure alternative using technical, human health, and environmental criteria. This recommendation shall include summary tables which allow the alternative or alternatives to be understood easily. Tradeoffs among health risks, environmental effects, and other pertinent factors among the alternatives evaluated shall be highlighted. The EPA will select the corrective measure alternative or alternatives to be implemented, based on the results of Tasks IX and X. At a minimum, the following criteria shall be used to justify the final corrective measure or measures.

A. Technical

1. Performance - corrective measure or measures which are most effective in performing the intended functions and maintaining the performance over extended periods of time shall be given preference;

2. Reliability - corrective measure or measures which do not require frequent or complex operation and maintenance activities and that have been proven to be effective under waste and facility conditions similar to those anticipated shall be given preference;

3. Implementability - corrective measure or measures which can be constructed and operated to reduce levels of contamination to attain or exceed applicable standards in the shortest period of time shall be preferred; and

4. Safety - corrective measure or measures which pose the least threat to the safety of nearby residents and environments, as well as to workers, during implementation will be preferred.

B. Human Health

The corrective measure or measures must comply with existing EPA criteria, standards, or guidelines for the protection of human health. Corrective measures which provide the minimum level of exposure to contaminants and the maximum reduction in exposure with time shall be preferred.

C. Environmental

The corrective measure or measures posing the least adverse impact (or greatest improvement) over the shortest period of time on the environment shall be favored.

TASK XI: REPORTS

The Respondent shall prepare a Corrective Measure Study Report presenting the results of Tasks VIII through X and recommending a corrective measure alternative. [number] copies of the preliminary report shall be provided by the Respondent.

A. Progress

The Respondent shall, at a minimum, provide the EPA with signed, [monthly, bimonthly] progress reports containing:

1. A description and estimate of the percentage of the CMS completed;

2. Summaries of all findings;

3. Summaries of all changes made in the CMS during the reporting period;

4. Summaries of all contacts with representatives of the local community, public interest groups, or state government during the reporting period;

5. Summaries of all problems or potential problems encountered during the reporting period;

6. Actions being taken to rectify problems;

7. Changes in personnel during the reporting period;

8. Projected work for the next reporting period; and

9. Copies of daily reports, inspection reports, laboratory/monitoring data, etc.

B. Draft

The Report shall, at a minimum, include:

1. A description of the facility:

   a. Site topographic map and preliminary layouts.

2. A summary of the corrective measure or measures:

   a. Description of the corrective measure or measures and rationale for the selection(s);

   b. Performance expectations;

   c. Preliminary design criteria and rationale;

   d. General operation and maintenance requirements; and

   e. Long-term monitoring requirements.

3. A summary of the RCRA Facility Investigation and impact on the selected corrective measure or measures:

   a. Field studies (ground water, surface water, soil, air); and

   b. Laboratory studies (bench scale, pick scale).

4. Design and Implementation Precautions:

   a. Special technical problems;

   b. Additional engineering data required;

   c. Permits and regulatory requirements;

   d. Access, easements, right-of-way;

   e. Health and safety requirements; and

   f. Community relations activities.

5. Cost Estimates and Schedules:

   a. Capital cost estimate;

   b. Operation and maintenance cost estimate; and

c. Project schedule (design, construction, operation).

[number] copies of the draft shall be provided by the Respondent to EPA.

C. Final

The Respondent shall finalize the Corrective Measure Study Report, incorporating comments received from EPA on the Draft Corrective Measure Study Report.

[THE FOLLOWING FACILITY SUBMISSION SUMMARY MAY BE PLACED IN THE BODY OF THE ORDER OR PERMIT AND REMOVED FROM THE SCOPE OF WORK. NOT ALL OF THE ITEMS LISTED BELOW MAY BE REQUIRED AT EACH FACILITY.]

Facility Submission Summary

A summary of the information reporting requirements contained in the Corrective Measure Study Scope of Work is presented below:

Facility Submission	Due Date
Draft CMS Report (Tasks VIII, IX, and X)	[NUMBER] days after submittal of the Final RFI
Final CMS Report (Tasks VIII, IX, and X)	[NUMBER] days after Public and EPA comment on the Draft CMS
Progress Reports on Tasks VIII, IX, and X	[MONTHLY, BI-MONTHLY]

Mtg. ō AMP

8/31/88

10:00 am.
78 conf. rm.

- draft consent agreement being drawn up (should be final in 4-5 wks.)
- asking AMP to sign w/in 60 days of receipt
  - if not signed w/in 60 days, AMP may:
    ① be turned back over to Superfund
    ② may force a unilateral order (EPA tells company what to do)

- Work plan will be negotiated after consent order is signed

Once consent order is received (in 4-5 wks.):
- meet ō AMP w/in 2-3 wks. to discuss
- finalize + sign w/in 60 days

Paul Miller - RE. Wright Assoc.
Dale Kortze } AMP
Ben Klinger }
Gordon West - RF Weston
Tom Bunton - Hydrogeologist
Lisa Motch - RCRA Corr. Action
Joe Kotlinski - RCRA Corr Action
Ann DeLong - PACRES

* PADER personnel not present although they were invited *